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PUBLIC HEALTH

PAPERS AND REPORTS

VOLUME XXII

PRESENTED AT THE TWENTY-FOURTH ANNUAL MEETING OF THE

American Public Health Association

BUFFALO, NEW YORK, SEPTEMBER 15–18

1896

QUARTERLY SERIES, VOLUME III

CONCORD, N. H.
Republican Press Association
1897

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CONSTITUTION

OF THE

AMERICAN PUBLIC HEALTH ASSOCIATION.

TITLE.

I. This Association shall be called "THE AMERICAN PUBLIC HEALTH ASSOCIATION."

OBJECTS.

II. The objects of this Association shall be the advancement of sanitary science, and the promotion of organizations and the measures for the practical application of public hygiene.

MEMBERS.

III. The members of this Association shall be known as Active and Associate. The Executive Committee shall determine for which class a candidate shall be proposed. The *Active* members shall constitute the permanent body of the Association, subject to the provisions of the constitution as to continuance in membership. They shall be selected with special reference to their acknowledged interest in, or devotion to, sanitary studies and allied science, and to the practical application of the same. The *Associate* members shall be elected with special reference to their general interest only in sanitary science, and shall have all the privileges and publications of the Association, but shall not be entitled to vote.

Delegates from national, state, provincial, and municipal boards of health, organized sanitary associations, and the army, navy, and marine hospital service, shall be entitled to be enrolled as active members upon presentation of their credentials to the Executive Committee. Members, not delegates from such bodies, shall be elected as follows:

Each candidate for admission shall first be proposed to the Executive Committee, in writing (which may be done at any time), with a statement of the business or profession and special qualifications of the person so proposed. On recommendation of a majority of the committee, and on receiving a vote of two thirds of the members present at the regular meeting, the candidate shall be declared duly elected a member of the Association. The annual fee of membership in either class shall be five dollars.

OFFICERS.

IV. The officers shall be a President, a First and a Second Vice-President, a Secretary, and a Treasurer.

All the officers shall be elected by ballot, annually, except the Secretary, who shall be elected for a term of three years.

PRESIDING OFFICER.

V. The President, or in his absence one of the Vice-Presidents, or in their absence a chairman *pro tempore*, shall preside at all meetings of the Association. He shall preserve order, and shall decide all questions of order, subject to appeal to the Association. He shall also appoint all committees authorized by the Association, unless otherwise specially ordered.

SECRETARY.

VI. The Secretary shall have charge of the correspondence and records of the Association; and he shall also perform the duties of Librarian. He, together with the presiding officer, shall certify all acts of the Association. He shall, under the direction of the Executive Committee, give due notice of the time and place of all meetings of the Association, and attend the same. He shall keep fair and accurate records of all the proceedings and orders of the Association; and shall give notice to the several officers, and to the Executive and other committees, of all votes, orders, resolves, and proceedings of the Association, affecting them or appertaining to their respective duties.

TREASURER.

VII. The Treasurer shall collect and take charge of the funds and securities of the Association. Out of these funds he shall pay such sums only as may be ordered by the Association, or by the Executive Committee. He shall keep a true account of his receipts and payments, and at each annual meeting render the same to the Association, when a committee shall be appointed to audit his accounts. If, from the annual report of the Treasurer, there shall appear to be a balance against the treasury, no appropriation of money shall be made for any object but the necessary current expenses of the Association, until such balance shall be paid.

STANDING COMMITTEES.

VIII. There shall be the following standing committees: (1) The Executive Committee, (2) the Advisory Council, (3) the Committee on Publication.

EXECUTIVE COMMITTEE.

IX. The Executive Committee shall consist (1) of the President, First Vice-President, Second Vice-President, Secretary, and Treasurer; (2) of six active members, of whom three shall be elected annually by ballot, to serve two years, and who shall be ineligible to reëlection for a second successive term; and (3) of the ex-presidents of the Association.

It shall be the duty of the Executive Committee to consider and recommend plans for promoting the objects of the Association, to authorize the disbursement and expenditure of unappropriated moneys in the treasury for the payment of current expenses; to consider all applications for membership, and, at the regular meetings, report the names of such candidates as a majority shall approve; and, generally, to superintend the interests of the Association and execute all such duties as may, from time to time, be committed to them by the Association. At least one month preceding the annual meeting of the Association, the Executive Committee shall cause to be issued to members a notice of such meeting, and they are authorized to publish the same in medical, scientific, and other periodicals, but without expense to the Association; and such notice shall contain the order of business to be followed at said meeting, and, briefly, the subjects to be presented and the special points of discussion.

ADVISORY COUNCIL.

X. The Advisory Council shall consist of one member from each state, territory, and district, the army, navy, and marine hospital service, the Dominion of Canada, and each of the Provinces, who shall be appointed by the President on the last day of each session, and who, besides acting as nominating committee of officers for the ensuing year, to be announced at such time as the Executive Committee may appoint, shall consider such questions and make such recommendations to the Association as shall best secure the objects of the Association. They shall at their first meeting elect from their own number a Secretary, whose record of their proceedings shall be made part of the records of the Association.

COMMITTEE ON PUBLICATION.

XI. The Committee on Publication shall consist of the Secretary and two active members, selected by the Executive Committee, who shall contract for, arrange, and publish, under authority of the Executive Committee, the proceedings of the Association, including such papers as have been examined and approved by the Executive Committee, or which have been submitted to them by the latter for their discretionary action.

REPORTS AND PAPERS.

XII. All committees, and all members preparing scientific reports of papers to be laid before the Association at its annual meetings, must give, in writing, the title of such reports or papers, the time to be occupied in reading them, and an abstract of their contents, to the Executive Committee, at least one week preceding the date of such meeting, to secure their announcement in the order of business.

MEETINGS.

XIII. The time and place of each annual meeting shall be fixed at the preceding annual meeting, but may be changed by the Executive Committee for reasons that shall be specified in the announcement of the meeting. Special meetings may be called, at any time or place, by concurrence of two thirds of the Executive Committee. There shall be no election of officers, or change of By-laws, or appropriation of money to exceed the amount at that time in the treasury, at such special meeting, except by a vote of a majority of all the members of the Association. Whenever a special meeting is to be held, at least one month's notice shall, if possible, be given by circular to all the members, together with the order of business.

QUORUM.

XIV. At the annual meeting nine members shall constitute a quorum for the election of officers, a change of the constitution, the election of members, and the appropriation of moneys.

ORDER OF BUSINESS.

XV. The order of business at all meetings of the Association shall be fixed by the Executive Committee, and such order must be completed before any other business is introduced, except such order of business is suspended by a vote of four fifths present.

ALTERATION OF CONSTITUTION.

XVI. No alteration in the Constitution of the Association shall be made except at an annual meeting, or unless such alteration shall have been proposed at a previous meeting, and entered on the minutes with the name of the member proposing the same, and shall be adopted by a vote of two thirds of the members present.

BY-LAWS OF THE EXECUTIVE COMMITTEE.

QUORUM.

1. Five members shall constitute a quorum for the transaction of such business as may come before the committee.

MEMBERS RESTRICTED.

2. No elective member of the Executive Committee shall be at the same time a member of the Advisory Council, if there is another member of the Association from his state or service.

PARLIAMENTARY USAGE.

3. Cushing's Law and Practice of Legislative Assemblies shall be the guide of parliamentary practice until otherwise ordered.

PAPERS.

4. All papers presented to the Association must be either printed, typewritten, or in plain handwriting, and be in the hands of the Secretary at least twenty days prior to the annual meeting, to insure their critical examination as to their fulfilling the requirements of the Association.

5. If any paper is too late for critical examination, said paper may be so far passed upon by the Executive Committee as to allow its reading, but such paper shall be subject to publication or non-publication, as the Executive Committee deem expedient.

6. All papers accepted by the Association, whether read in full, by abstract, by title, or filed, shall be delivered to the Secretary as soon as thus disposed of, as the exclusive property of the Association. Any paper presented to this Association and accepted by it shall be refused publication in the transactions of the Association, if it be published, in whole or in part, by permission or assent of its author, in any manner prior to the publication of the volume of transactions, unless written consent is obtained from the Publication Committee.

7. Day papers shall be limited to twenty minutes, and evening papers to thirty minutes each.

DISCUSSION OF PAPERS.

8. After the leading papers on each subject, as indicated by the Executive Committee, have been read, discussion shall follow, and be confined

strictly to the subject of these papers; and each speaker shall be limited to ten minutes, and shall not speak a second time until after every other member who desires to be heard, and then only for five minutes, except by unanimous consent.

9. The Chair shall notify gentlemen who desire to speak to send up their names, and they shall be called on in the order sent up; and he may, at his discretion, limit the time of speaking to five instead of ten minutes, if in his judgment it may become necessary to do so in order to allow each one on the list an opportunity to be heard.

PUBLICATION COMMITTEE.

10. The Committee on Publication, charged with the duties of selecting and printing the papers and transactions of the Association, shall consist of three active members of the Association, and of whom one shall be the Secretary, appointed by the Executive Committee during the session of the Association, and selected with reference to their facilities of meeting.

11. All papers read by title, and others not definitely passed upon by the Executive Committee, shall be referred to the Publication Committee for critical examination; and said committee is authorized to reject such papers as in its judgment are not worthy of publication, and to omit such others as cannot be included within the limits of the annual volume.

12. The Publication Committee shall procure a copyright on the transactions in the name of the Association, and the committee shall have full charge of the publication of the transactions.

APPLICATION FOR MEMBERSHIP.

13. All applications for membership must be made upon the application blank of the Association.

14. Persons not members, having prepared papers to be presented at the meetings of the Association, shall be proposed for membership at the first business meeting of the Association.

EXPENDITURES.

15. All bills connected with the publication of the transactions shall, upon the approval of the chairman of the Publication Committee and the Secretary, be signed by the president of the Association, and paid by check of the Treasurer directly to the party concerned; and the President shall not approve any bill, relating either to publishing or printing, without the approval first of the chairman of the committee in charge thereof.

16. Bills for current expenses shall be first approved by the Secretary,

then sent to the President, and on his approval they shall be paid by check of the Treasurer directly to the parties interested.

17. The actual and necessary traveling expenses of the Secretary and Treasurer to the annual meeting of the Association, and to one meeting of the Executive Committee, shall be classed as current expenses.

RESOLUTIONS.

18. All resolutions presented to the Association shall be sent to the Chair in writing, and referred to a committee without discussion.

ARREARAGES.

19. The arrearages of all members remitting their dues for two years shall be canceled up to the date of the last payment, but they shall be entitled to the transactions of the Association only for the years for which they have actually paid.

AUDITING COMMITTEE.

20. An Auditing Committee shall be appointed by the Chair to audit the accounts of the Treasurer, and report upon the same.

OFFICERS AND COMMITTEES

OF THE

AMERICAN PUBLIC HEALTH ASSOCIATION.

OFFICERS, 1896–1897.

President, ...	Dr. HENRY B. HORLBECK, *Charleston, S. C.*
First Vice-President, .	Dr. PETER H. BRYCE, *Toronto, Ont.*
Second Vice-President,	Dr. ERNEST WENDE, *Buffalo, N. Y.*
Secretary, ...	Dr. IRVING A. WATSON, *Concord, N. H.*
Treasurer, ...	Dr. HENRY D. HOLTON, *Brattleboro, Vermont.*

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Prof. STEPHEN SMITH	*New York City.*
Deputy Surgeon-General JOHN S. BILLINGS	*U. S. Army.*
Prof. ROBERT C. KEDZIE	*Lansing, Mich.*
Medical Director ALBERT L. GIHON	*U. S. Navy.*
Dr. HENRY P. WALCOTT,	*Cambridge, Mass.*
Surgeon-General GEORGE M. STERNBERG	*U. S. Army.*
Dr. CHARLES N. HEWITT	*Red Wing, Minn.*
Dr. HENRY B. BAKER	*Lansing, Mich.*
Dr. FREDERICK MONTIZAMBERT	*Quebec, P. Q.*
Dr. FELIX FORMENTO	*New Orleans, La.*
Dr. SAMUEL H. DURGIN	*Boston, Mass.*
Dr. E. P. LACHAPELLE	*Montreal, P. Q.*
Dr. WILLIAM BAILEY	*Louisville, Ky.*
Dr. EDUARDO LICÉAGA	*Mexico, Mex.*

(The ex-Presidents, *ex officio* members Executive Committee.)

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(Elective.)

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Dr. HENRY MITCHELL	*Asbury Park, N. J.*
Dr. U. O. B. WINGATE	*Milwaukee, Wis.*
Dr. JESUS MONJARAS	*San Luis Potosi, Mex.*

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Arkansas	
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U. S. Navy	Medical Director Newton L. Bates, *Washington, D.C.*

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Province of Quebec	Dr. E. P. Lachapelle, *Montreal.*
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Sinaloa	Dr. Leopoldo Ortega, *Mazatlan.*
Tabasco	Dr. Juan Muldson, *Tabasco.*
Tamaulipas	Dr. Juan F. de la Garza, *Laredo.*
Tlaxcala	Dr. Rafael Loaiza, *Tlaxcala.*
Veracruz	Dr. Gregorio Mendizabal, *Mexico, D. F.*
Yucatan	Dr. Jose Ramirez, *Mexico.*
Zacatecas	Dr. Tomas Lorek, *Zacatecas.*
Territorio de la Baja Califª	Dr. Tobías Nuñez, *Mexico, D. F.*
Territorio de Tepic	Dr. Carlos Fenelón, *Tepic.*
Distrito Federal	Dr. Domingo Orvañanos, *Mexico, D. F.*

PUBLICATION COMMITTEE.

Dr. Irving A. Watson	Concord, N. H.
Dr. Granville P. Conn	Concord, N. H.
Dr. Samuel W. Abbott	Wakefield, Mass.

SPECIAL COMMITTEES.

ON THE POLLUTION OF WATER-SUPPLIES.

Deputy Surgeon-General Charles Smart, U. S. A.	Washington, D. C.

(With authority to select associates.)

ON THE DISPOSAL OF GARBAGE AND REFUSE.

Rudolph Hering, C. E.	277 Pearl St., New York City.
Dr. Benjamin Lee	Philadelphia, Pa.
Dr. J. A. Beaudry	Montreal, P. Q.
Roberto Gayol, C. E.	Mexico, Mex.
W. C. R. Colquhoun	Wilmington, Del.

ON ANIMAL DISEASES AND ANIMAL FOOD.

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Prof. Jose L. Gomez	Mexico, Mex.
Dr. Henry N. Avery	Minneapolis, Minn.
Dr. Irving A. Watson	Concord, N. H.
Dr. C. N. Hewitt	Red Wing, Minn.

ON CAR SANITATION.

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Dr. Granville P. Conn	Concord, N. H.
E. C. Jordan, C. E.	Portland, Me.
Dr. Domingo Orvañanos	25 Chavarria St., Mexico, Mex.
Dr. William C. Bailey	Las Vegas, N. Mex.

ON STEAMSHIP AND STEAMBOAT SANITATION.

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Medical Director Albert L. Gihon, U. S. N.	New York City.
Dr. S. H. Durgin	Boston, Mass.
Supervising Surg.-General Walter Wyman, U. S. M. H. S.	Washington, D. C.
Dr. A. H. Doty	Rosebank, Staten Island, N. Y.

INTERNATIONAL COMMITTEE ON THE PREVENTION OF THE SPREAD OF YELLOW FEVER.

Dr. Felix Formento	New Orleans, La.
Surgeon-General George M. Sternberg, U. S. A.	Washington, D. C.
Dr. Eduardo Licéaga	4 San Andres St., Mexico, Mex.
Dr. Manual Carmona y Valle	Mexico, Mex.
Dr. Samuel R. Oliphant	New Orleans, La.
Mr. Alfred V. Wood	Brunswick, Ga.
Surgeon Joseph Y. Porter, U. S. A.	Key West, Fla.

ON THE TRANSPORTATION AND DISPOSAL OF THE DEAD.

Dr. C. O. Probst	Columbus, O.
Dr. Elzéar Pelletier	Montreal, P. Q.
Dr. J. D. Griffith	Kansas City, Mo.
Dr. Peter H. Bryce	Toronto, Ont.
Dr. David Cerna	Galveston, Texas.

ON THE RELATION OF FORESTRY TO PUBLIC HEALTH.

Dr. J. F. A. Adams	Pittsfield, Mass.
Dr. Salvador Garciadiego	Guadalajara, Mex.
Dr. John Coventry	Windsor, Ont.
Dr. James B. Eagleson	Seattle, Wash.
Dr. William H. Brewer	New Haven, Conn.

ON NOMENCLATURE OF DISEASES AND FORMS OF STATISTICS.

Dr. Samuel W. Abbott	Wakefield, Mass.
Dr. Jesus E. Monjarás	San Luis Potosi, Mex.
Dr. Elzéar Pelletier	Montreal, P. Q.

Dr. Cressy L. Wilbur	Lansing, Mich.
Dr. A. G. Young	Augusta, Me.

ON THE CAUSE AND PREVENTION OF INFECTIOUS DISEASES.

Dr. J. J. Kinyoun, U. S. M. H. S.	Washington, D. C.
Dr. C. N. Hewitt	Red Wing, Minn.
Surgeon-General George M. Sternberg, U. S. A.	Washington, D. C.
Dr. Jesus E. Monjarás	San Luis Potosi, Mex.
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ON THE CAUSE AND PREVENTION OF INFANT MORTALITY.

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ON TRANSPORTATION OF DISEASED TISSUES BY MAIL.

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Dr. Frederick Montizambert	Quebec, P. Q.
Dr. Eduardo Licéaga	Mexico, Mex.
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ON DISINFECTANTS.

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The secretary is not a *member* of the board.

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During the legislative session of 1895, a bill was introduced creating a state board of health, which was killed in the committee.

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JOURNAL

OF THE

American Public Health Association

Publication Committee { IRVING A. WATSON, M. D.
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All communications should be addressed:

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ANNUAL VOLUME,
NO. XXII.

JANUARY, 1897.

QUARTERLY SERIES.
VOL. 3, PART 1.

THE PRESIDENT'S ADDRESS.[1]

By EDUARDO LICEAGA, M. D.,

President of the Association—President of the Supreme Board of Health of Mexico—Professor of Surgical Therapeutics in the National School of Mexico—Member of the Academy of Medicine—Director of the Maternity and Infant Hospital, Etc., Etc., Mexico, Mex.

Mr. Mayor, Ladies, and Gentlemen:—I consider it a great honor to be allowed to address you at this moment, and from this place; an honor to myself, an honor to my country, which you have distinguished in my person. In my own name, and in that of my country, I sincerely thank you for the honors with which you have covered me.

The American Public Health Association, which occupies such an elevated position in view of its objects, its extension, and the prominence of a great many of its members, represents in the scientific world the tendencies of this great nation to combine effort, not to work in an isolated manner; to combine for commercial objects; to combine for industrial objects; to combine for political objects; to combine for scientific objects! Its tendency is to unite individual efforts; to multiply efforts; to centuplicate efforts; this is the secret of its great force, of its unlimited power, of its incessant expansion in every direction.

At this present moment of history, the American nation represents both the present and the coming epoch. It considers itself the custodian of all ability, and it undertakes everything. It feels itself dominated by the passion for work, and is an unwearied worker. It feels itself imbued with courage for everything and it ventures on all undertakings; it possesses a full understanding of its own energy and determination; and therefore dominates every other. This is the people!

As is to be supposed, the units of this people constitute the element that gives the nation its color, its life, and its impulse. Every man—and in saying every man, I also include every woman—considers himself as having been born to work without rest, to study, to invent, as if he was the only one who had that task; and he works, studies, and invents, in obedience to an imperious necessity of his organization, or to a natural function, an irresistible desire to work and to move. These units are those which are centuplicated by the Association!

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[1] Delivered at the Buffalo meeting.

The American Public Health Association has imposed on itself a programme of the greatest importance,—to study hygiene; to propagate the study of hygiene throughout the medical fraternity; to propagate hygiene amongst the engineers; to propagate hygiene and its study amongst the people at large, so that from the people it shall rise to the municipal corporations, to the governments of the states, and finally, to the government of the nation. And that programme is being continually carried out with the precision and exactitude with which an engine fulfils its multiple operations: the physicians work and study and publish their investigations; the press takes on itself the duty of carrying those studies to all parts, in the form of instructions as to the precautions to be taken against phthisis, scarlatina, diphtheria, typhoid, etc.; in the form of advice, as to the means for discovering the adulterations in food; in the form of recommendations to avoid the use of alcohol; of a propaganda for the formation of temperance societies; of tables which show in the most vivid colors the lamentable consequences of alcoholism; but everything clear, everything simple, everything in small sheets that hardly require any time for reading—when all the world is occupied, it is necessary not to waste time—but in brief, exact and energetic phrases, indicate the danger, discover an enemy, and show how the one is to be avoided and the other to be combated.

As all the citizens of this great nation can read; as they all endeavor to enlighten themselves on matters relating to practical life; as they all show a tendency to surround themselves with those comforts that render life grateful and prolong existence, the seed sown by this Association has fallen on good soil, that was well prepared and that has produced an abundant crop in the way of health and prosperity.

The programme of the Association has been well carried out, because it has continued educating the people in the systematic manner, and the American Public Health Association may well be proud of its work, if it were capable of any such small feeling.

Its propaganda has not been limited to the American Union; it first penetrated into Canada, where it found many able adepts amongst the practical and intelligent men of that colony. It then passed the frontiers on the south, and spread itself over the enormous extent of the Mexican territory.

A prolonged series of political convulsions and of sanguinary wars had enervated the vital energies of the nation. From one end of the Mexican land to the other, nothing was heard except the sound of arms and the cries of combat. Under these conditions, mankind cannot take thought for the preservation of health, the prolongation of life, or seek for an agreeable existence. But fortunately, we have now reached better times; for the last twenty years, under the upright, wise, and prudent administration of General Porfirio Diaz, my country has enjoyed the blessings of peace, and under the beneficent influence of that administration, the fields are cultivated, work is kept up in the factories, schools are opened, and everywhere do we feel the necessity of living, so that we can now dedicate some thoughts and some study to the counsels of hygiene.

Under these favorable circumstances, the American Public Health Association invited the Supreme Board of Health of Mexico to join forces with itself, and the latter corporation sent its delegates for the first time to attend the meeting of 1890. At the subsequent meeting in Kansas City, the Association officially added the physicians of the Mexican republic to its list of active members of the Association.

It was a great encouragement to the sanitary physicians of Mexico to find themselves associated with their American and Canadian fellow-laborers, and to join with them in carrying forward the standard of progress in sanitary studies; studies that from that date received a special attention. Prominent members of the Association found much to praise in our Sanitary Code; they encouraged us to follow up the quarantine reforms; with heartfelt and sincere phrases they expressed their approbation for our enactments, by which we gave force of law to the precepts which have been scientifically sanctioned in the sanitary conventions and which the sanitarians and diplomats have agreed upon, first in Venice, and afterwards in Dresden. The Association has shown its appreciation of the efforts made by our country in sending to each meeting numerous delegations, of which each member has carried his small contribution in writing; and lastly, it has honored my country by elevating to its own presidential chair, the humblest of Mexican physicians for his scientific merits, but one of the first—I do not hesitate to say—for the enthusiasm with which he endeavors to contribute to the objects of this Association.

Not feeling myself endowed with the talents that are required for the important post of president of the Association, I have attempted as far as possible to supply my deficiencies with my good-will and intentions; and I beg my distinguished friend, Lieutenant-Colonel Woodhull, first vice-president for the past year, to fulfil my duties as far as refers to the United States and Canada, reserving to myself the looking after of affairs in Mexico. I beg this gentleman, with his great talents and knowledge of parliamentary rules, as well as his energy and prudence of character, to undertake the direction of the debates in this meeting, but at the same time reserving to myself the prerogatives which are granted to me under the regulations of directly addressing myself to the chairmen of committees who have been charged with the study of the different subjects that the Association has in hand, and corresponding with them, so that they would each require from the members of their respective committees the presentation of a special paper in due time, with the object that the chairmen should combine all the works relative to each separate branch, should analyze them, compare them amongst themselves, and with all these elements, aided by his own personal experience on the subject, and elevated criterion, he should present a report that would be printed, distribute it amongst the members attending the congress, and be read in the sessions which are now about to be opened.

These reports would then serve as a subject under discussion, and as each one of the members would previously know the subject, the discussion resulting on such reports would be of the very greatest benefit, and the resolutions which would subsequently be passed would undoubtedly represent the last word of science on the questions that had been studied by each one of the committees.

I have also submitted to the deliberation of Col. Woodhull, of our intelligent secretary, and other members of the executive committee, the desirability of proposing a certain number of questions or problems which would be studied during the course of a year, and the resolution of which would be presented in the meeting of the year following.

I have been encouraged in proposing this innovation by the knowledge I have acquired of the vital forces possessed by this Association, which spread over the whole vast area of the Northern Continent of America, an Association which has members in all latitudes, at all elevations. the same in the heart of the continent as on its vast littoral; distinguished sanitarians, who form the boards of health of almost all the states, provinces, and municipalities; it has members in the navy, in the army, and in the public administration. Its members are to be found in all the scientific societies of the United States, Canada, and Mexico. Amongst them, we find physicians who are in contact with all social classes; who, from day to day, study all diseases; who with the greatest intelligence investigate the causes that have produced these diseases; what are the foods and drinks that cause injury to health; in what manner it is influenced by unhealthy dwellings, badly paved streets, defective drainage, or impurities in drinking water; who discover in what manner transmissable diseases are communicated through water, through the food, through clothes which are already contaminated with dejections, and through the contact, direct or indirect, of diseased persons with healthy persons.

The American Public Health Association enjoys exceptional privileges for the prosecution of its great crusade against the causes of disease. This is the society that is destined to fully show the world *that the preservation of health, the prolongation of life, and the physical improvement of the human race*, are the ideal principles that ought to be kept in view by all the members who form the corporation. They ought to bear these things in mind as the objects of material prosperity, and as a means to the moral improvement of humanity in general.

In order to reach these elevated objects, the society is able to rely on the great number of its members on the unwearied activity of which this laborious nation has given so many proofs, on the great number of investigators amongst its members, in all branches of scientific study, on the practical good sense of these men of the Anglo-Saxon race, and on the activity with which this great army of workers undertakes every enterprise.

When I suggest the idea of proposing special subjects of study for the coming year, I do not by any means wish to limit the unquestionable liberty which is enjoyed by every member, of selecting the subject that is most to his taste or agrees best with his personal inclination, his own ability, his immediate surroundings, or the inspirations of his own genius. This individual activity, which as I have already said, is the great secret of the power of this nation, can in no way be prejudiced by the organization of our labors, just as there is no diminution of the power of flowing water when it is confined to a canal, and its current is directed in the most favorable direction for the interests of navigation, agriculture, and industry; just as there is no lessening of the potency of electricity when it is obliged to move machinery or is systematically distributed in the form of light, as has been done by the immortal Edison.

The proposition which I now have the honor to present, has for its object the utilization of these important vital forces, and the bringing them together at any given moment, with the view to the solution of any problem in hygiene, or to the preparation of this solution, or to the planting of that problem in an entirely practical form, or, lastly, to the demonstration that the solution of any given problem is not practical for the moment. Although it may at first sight appear that this is not the moment for proposing innovations, I hope you will pardon me if I enter on a few details with a view to explaining my idea, because in this general meeting, where the audience is composed not only of the physicians who attend the meeting, but also of the authorities of the city and other distinguished members of this community, I say that it is in such a meeting that I may be permitted to present the suggestions which are of such general interest, so that every person present may be able to form an opinion on the matter, and be prepared for the discussion when the committees give an account of their resolution in the private sessions.

I hope that you will kindly permit me to give a few examples of the form under which I will propose the new questions. It is a fact clearly demonstrated, that we can suppress epidemics at the time of their commencement, by isolating the first patients, and disinfecting the objects which they have contaminated, whether these are the clothes that they have used, the furniture that has been found in their respective rooms, or the rooms in which they were kept during the disease. Well now, one of my new propositions would be as follows:

"*The isolation is not required to be equally strict for all diseases.*"

In fact, the isolation in cases of diphtheria, must be absolute and complete; all persons who attend the patient must be entirely separated from the rest of the healthy inhabitants of the house or hospital in which the case existed; the precautions on the part of the attendants must be excessive, because the germs are in the nose, in the pharynx or in the larynx; they are expelled with the nasal secretions, with the saliva, or with the secretions of the larynx, and can be projected to a certain distance, and so contaminate all the objects which surround the patient.

On the contrary, in cases of typhoid fever, in which only the intestinal renal dejections carry the germ which is to produce the contagion, the isolation is not so rigorous; and there are even hospitals in which patients are not absolutely isolated, but precautions are taken to collect their dejections in vessels which contain microbicide substances which will sterilize such dejections.

A remarkable illustration of my proposal is found in the resolutions which have been reached by the sanitary conventions of Venice, Dresden, and Paris, with respect to cholera. Extraordinary precautions had always been taken against this frightful plague; in order to prevent its invading a nation, all vessels arriving were subjected to a long quarantine, besides fumigation and disinfections, to say nothing of the sanitary cordons, or pickets. disinfection of correspondence, etc., etc., but science stepped forward and clearly demonstrated that the *coma-bacillus* lives in the digestive apparatus, from which it is expelled by the dejections, and that the latter are what contaminate the clothes and soil on which they fall; and that by these two means they corrupt the waters, which being used for drinking purposes, can spread the disease throughout a whole town, as was plainly observed in Hamburg during the last epidemic of cholera. Once this declaration was made by science, the restrictive measures were reduced to the destruction and disinfection of the dejections, the disinfecting of the soil that had been contaminated, the destruction or disinfecting of the clothes that had been soiled, and the prevention of the contamination of the water by all the means that science and experience have placed within the power of man; and whenever these precautions have been taken, the epidemic has been kept out of the towns, and even if some few isolated cases have been found, the disease has in no way extended itself, as has always happened in England, where vessels do not undergo quarantine, and as now happens in many countries of Europe where communication is possible and easy, and where sanitary cordons have been abolished.

As I have above shown, it is necessary to give a different application to the principle of isolation for every contagious disease.

"*The methods of practising disinfection must also be different with respect to each contagious disease.*"

The three examples which I have above cited with respect to isolation, can also serve us in discussing the question of disinfection.

In cases of diphtheria, it is necessary to disinfect everything that could possibly have been contaminated by the excretions of the patient, and whatever may have been the channel through which they have been expelled; whilst in cases of cholera, it is only necessary to disinfect the dejections and everything that has been soiled by them; but there is another clearer example to be found in tuberculosis. The Koch's bacillus is expelled by tuberculous patients who are attacked in either the lungs or the larynx, together with their esputa; should this fall on the clothes, on the soil, or on the walls, it dries; and the subsequent currents of air scatter the dust loaded with bacilli through the atmosphere, in which form it is swallowed and aspirated, reproducing the same disease. It is enough to receive the esputa in spittoons which contain bactericidal liquids, or which are properly washed by some process that destroys the germs, to prevent the spread of the disease.

In the Falkenstein sanatorium, near Frankfort in Germany, Dr. Dettwieler obliges his patients to use a spittoon of his own invention, as long as they remain in his establishment; but he also allows them to go about everywhere, to go to the gardens and parks, and as yet there has been no case found in which the healthy persons who are serving in that establishment have suffered contagion.

From the above remarks, it will be seen that it is necessary to adapt the methods of disinfection to the nature of the germ of each disease, and to the special manner in which each one of them is disseminated.

Another proposition, which in my opinion demands a special study, is the technique of disinfection.

If this operation is carried out every day; if the number of times that it is executed is greater in proportion to the increase of the number of people employed in that service, we do not find that the benefits obtained in the diminution of transmissible diseases is entirely in proportion to our efforts; and this shows that there must be some defects in the technique of disinfection, that are either not thoroughly understood, or that up to this moment can not be avoided.

In this connection, I must recall what I have already had the honor of saying on this subject before this society. When Lister demonstrated by experiments that the germs found by Pasteur in the atmosphere were those which contaminated wounds and produced the complications which rendered them so serious, he invented a technique—it is true that it was very complicated—which would prevent the contact of the pathogenic germs with the wounds, or would destroy those germs if they had already effected a lodgment; and by this means he got the wounds to heal by first intention as a general rule, and also obtained a rapid and complete cure of wounds which had been caused by accident or for a therapeutic object. All the surgeons who strictly followed the precepts of Lister obtained the same wonderful results that he himself had reached; but all those who attempted to alter his technique, or to simplify it without possessing his genius or understanding the object of his complicated manipulations, did not obtain the same beneficent results as Lister, and blamed the method, attributing to it an inefficacy which only arose from the imperfections in its application. Once the Listerian doctrine was correctly interpreted by all surgeons, once the technique of the most eminent among them realized the ideal of not leaving any germs in the neighborhood of the wound,—that is to say, once they began the practice of *asepsia*, or otherwise, once that by means of physical or chemical agents, surgeons got so far as to destroy the germs deposited in the wounds, that is to say, once they practised a *perfect antisepsia*—then they all began to obtain the same advantageous results as Lister, and they reached the conviction of the truth of his doctrine. From that epoch may be said to commence the extraordinary advantages in surgery, that will render the last quarter of this century memorable in the coming generations.

At every step that it advances, science discovers a new germ generating a disease. It studies the natural history of that germ, its dwelling-place, the conditions that are favorable and those that are adverse to its existence; it utilizes the antagonism of some germs for others, and obliges those which are innocent to serve in the destruction of those which are injurious; it studies the secretions of these microbes, and the manner in which they act on the system. Biology teaches us the ways in which to study how these infinitely small beings serve to maintain the admirable equilibrium of the functions that constitute life; it teaches us that our organism is sufficient in itself to combat these germs that disarrange the tissues, or the functions, and from that moment we can define the office that is to be filled by therapeutics and hygiene when brought face to face with disease; the former must only carefully watch over and assist the system in its struggle against the internal or external elements of disease; but it should never disturb the efforts that the system makes towards the re-establishment of health, or in case of need, it should come to its assistance with the powerful resources of Serotherapia. But of this I will speak later on.

The mission of hygiene has been traced from the most remote periods, —*the prevention of disease.* To prevent disease is an entire programme. Its dominion is so vast that investigators everywhere multiply themselves, and the magnitude of this association is a proof of the importance which is accorded to the study of hygiene. But I will not undertake to consider it in its full extent; I will merely concentrate my remarks to one point, that which refers to the transmission of infectious diseases.

I shall compare this transmission of infectious diseases with the contamination of a wound.

In the former case, the problem is to separate the germs, so that they shall not come in contact with the wound; whilst in the latter case, the problem consists in preventing the germs which cause the sickness of an individual from coming into contact with the healthy man, who is—if I may be allowed the expression—the wound which is to receive the germ. The operation which in the former is called *asepsia*, in the latter is called *isolation* of the patient.

In surgery, when it has been found impossible to keep the germ away, and the wound is already infected, it becomes necessary to destroy the germ wherever it is found, and for that purpose we employ *antisepsia*. In the latter case, the germ has already effected a lodgment in the clothes, in the soil, in the walls, in the dust, in the liquid dejections, and it becomes necessary to destroy by means of antisepsia, which in this case is called *disinfection*.

To adapt this to its object, to carry it out so that it will destroy the germ wherever it may be found, to render it efficient so that it shall obtain the desired result and at the same time not go beyond that desired object,—this is the problem to be studied.

I believe that that problem can be formulated as follows: "*To study the physical or chemical agents that are adapted to the destruction of each different morbific germ, but without going beyond that object.*"

Should this problem be resolved in practice, should the association by means of its committees propose comparative investigations that would be conducted under a uniform plan, and with respect to each one of the transmissible diseases, the question may be studied from year to year, and the resolutions be presented in the following meeting, seeing that the association can count on the isolated efforts of its different members, efforts which, although isolated at the time, would become combined efforts when a special commission compares and condenses the different results obtained. It will then be seen that hygiene can do, in transmissible diseases, what surgery has done with respect to wounds.

Another question that merits the attention of this association, on account of its intimate connection with the subject of isolation and disinfection, is the periods in which the different infectious diseases are contagious, and the time when a person suffering from one of these diseases is dangerous to his neighbors.

This question is of great importance, so that it ought to have been treated of before the other; but it has presented such difficulties for its resolution with respect to each disease, that I have preferred to bring it forward with the same uncertainty that it offers in many cases. If through many years of observation, the comparison of numerous statistical results and even many years of experiments, have enabled us to define the period of incubation of certain specific diseases, the time when they commence to be contagious and the channel through which the contagion is made, there are other diseases with respect to which we have not as yet been able to determine these data.

Diphtheria pertains to the first of these groups. We may fairly say that almost everything has been clearly defined with respect to that disease; the germ that produces it, the place in which it effects a lodgment, its methods of reproduction, the resistance that it presents to physical and chemical agents, and its ability to resist those same natural agents; as there are instances in which the Löffler bacillus has been able to support four, five, and up to eleven years of life deposited in clothing. Well, even in this disease there are many obscure points to be cleared up; we know the bacillus, but that is not the agent that directly produces the diseases, it is a poison which is produced by the bacillus, but its exact nature is as yet unknown. We know of cases in which a child who has left the hospital entirely cured and with its clothes disinfected, is capable of producing the contagion. After the formation of many theories, we have now reached the point in which we understand that the contagion depends on the persistent vitality of the Löffler bacillus in the mouth of the child who has been cured. In order to free ourselves from this possible contagion, it is empirically said that we only require from twenty-five to thirty days.

If there is so much uncertainty with respect to this disease that has been carefully studied, how much will there not be with respect to others that have received less attention! There are diseases that up to the present moment, defy all the resources that hygiene commands by way of precaution. To this group pertains the disease of measles. Observation and experiments have demonstrated, that the germ which produces this contagion has little resistance against exterior agents, that it is contagious from the moment that the disease enters on its period of incubation, and therefore it is almost impossible to prevent its appearance. How can we possibly entertain suspicion of a child who is happy at play, and to all appearance healthy, and yet, who not only carries the germ of the disease, but is also capable of transmitting it? These problems, however difficult their solution may be, are those which most strongly interest sanitarians. The disease of measles is serious in itself during certain epidemics, but it is still more so on account of the frequent and alarming complications by which it is accompanied, and because it favorably prepares the ground for the appearance of tuberculosis. Think of the great benefits we could confer on humanity if we were able to prevent this disease! How much greater would these benefits become if we were enabled to prevent scarlatina, *which is more frequent* than measles, generally of a more serious character, and which attacks a greater number of children.

It would be useless for me to continue enumerating the other transmissible diseases. The examples I have cited are enough to show the advisability of organizing *a committee to study the period or periods during which each contagious disease is transmissible, and the time during which every patient who has suffered from such disease is dangerous to the community.*

The same methods of study can be applied to the diseases against which we can take precautions by means of vaccination. The admirable results which we have seen for the last century through the Jenner vaccine; the already unquestionable advantages of the preventative vaccine against rabies and those which are now being announced everywhere, with respect to other diseases, lead us to hope that if the existing committee is given an organization such as I propose, it will lead us to the most hopeful and beneficient results.

Serotherapia, that therapeutic and powerful resource that has furnished us arms with which to combat terrible diseases, was most clearly and exactly prognosticated by Gen. George H. Sternberg, a most distinguished member of this Association and one of its principal ornaments.

Serotherapia, which is a new and recently discovered element of therapeutics, is threatened with the same discredit that has already fallen on all the drugs that are employed in therapeutics, and from being a strictly scientific resource, it appears likely to become an article of commerce. Just as the impurity of medicines and their imprudent application are every day giving rise to their inefficacy as a means for curing, or are in themselves the cause of the disease and even poisoning, so in serotherapia, when practised with liquids which are not scrupulously prepared, are badly preserved or incorrectly applied. Epidemics of diphtheria have been produced in some provinces of France by means of fictitious anti-diphtheritic serum of Roux. The American Public Health Association would confer an immense benefit on humanity and would greatly contribute to the deserved prestige of serotherapia, if it would organize a committee to study a way of regulating the gratuitous administration or the sale of serums and organic liquids, which are now employed in therapeutics.

Ladies and Gentlemen: I beg you to pardon me for this digression of a scientific character, and for my apparent forgetfulness of the audience I have before me, but I certainly have not forgotten to whom I am speaking, because these questions are of the greatest interest to all of us: the transmission of contagious diseases is of interest to the whole community. The members of the American Public Health Association come from distant places, leaving their families, abandoning their lucrative business, bearing the fatigue of the journey, and all for the object of bringing their contribution of observations, of science and of experience, to the solution of these difficult and important problems. They interest the public officers who are here present, because it is the first duty of the public administration to watch over the health of the citizens, and this is never in greater danger than at the time that transmissible diseases appear. On the other hand, epidemics can not be checked in their development, except through the action of persons in authority. Only they have power to impose quarantine; only they can close the schools; only they can suspend public spectacles, and prevent the public from contaminating itself in the great places where they meet. Only the public authorities have power to interrupt communication in those cases in which the health of the people becomes the supreme law.

These questions are of interest to the chiefs of work-shops, to the directors of colleges and asylums, who are the principal persons charged with the necessary watchfulness for preventing the entry of epidemic diseases amongst the people under their charge. They are of interest to the heads of families, who cannot desire to see their houses invaded by any contagious disease. Especially are they of interest to mothers, who never want to see their little children, who constitute the charm of their lives and the delight of existence, attacked with whooping-cough, scarlatina, or diphtheria. They are the ones who are specially interested above all others in knowing how to close the doors against such terrible and fearful enemies. These studies are therefore of the greatest interest to everybody, as they tend to preserve the health and happiness of all those beings whom we specially love !

Gentlemen of the American Public Health Association:—I beg you will receive my sincere congratulations on coming again together in the twenty-fourth meeting of this Association, on having selected for the place of our meeting this beautiful and interesting city, which is so splendidly placed at the eastern end of this delightful lake, a lake that supplies the waters for this powerful river that further on precipitates itself in a grand cataract, a stupendous marvel of nature that thousands of pilgrims from all parts of the world come to contemplate and admire.

In this interesting city, that, like many others of the American Union, appears to separate itself in its wonderful growth from natural laws ; that, not satisfied with receiving the agricultural treasures which are cultivated in the Western and Central States of this Republic, by innumerable vessels that sail over these interior seas, modestly called lakes, multiplies its railroads and converts itself into an immense granary ; that not only distributes its products throughout the states that surround it, but also sends them to distant Europe ; in this city, that has elevated so many temples to the Divinity, that always has its arms open to works of benevolence, that maintains asylums for the disinherited of this world ; where there is no misfortune that cannot be remedied, or charitable work that cannot be undertaken ; in this city, which is about to show us its many and well-ordered sanitary establishments, and the measures it has adopted to render Buffalo one of those cities of the American Union in which the greatest success has been obtained in the lowering of the death-rate : in this city, which will shortly show us its lunatic asylum, a vast monument to science and to civilization ; its primary and superior schools, its hospitals and its medical college ; its school of fine arts, its library and its museum : and lastly, in this city, which offers to us its hospitality and offers us an opportunity of again meeting to render our homage to science, and to work together for the physical well-being of our fellow-creatures.

ADDRESS OF WELCOME.[1]

BY HIS HONOR EDGAR B. JEWETT, MAYOR OF THE CITY OF BUFFALO.

MR. PRESIDENT AND MEMBERS OF THE AMERICAN PUBLIC HEALTH ASSOCIATION:—I bid you welcome to the city of Buffalo. Thrice welcome are you all! The distinguished honor you have done us, in choosing this city as the place for your deliberations this year, is appreciated by all of our citizens. We have long been looking forward to your coming—eagerly awaiting the pleasure of your company in this, the Queen City of the Lakes, and destined to be, as we believe, the great electric center of the world.

The fame of this Association has preceded it, and in you, its members, we recognize the leading authorities on the subject of public sanitation on the American continent.

This reputation has not been gained in a day, or in a year; but by a devotion of many years to the scientific study of the subject of the alleviation of human suffering and the preservation of human life, by means of organized public effort.

When we consider all that this Association has done in the way of organizing agencies for the prevention of disease, and all that it has done by way of instruction as to the modern methods of public sanitation, it becomes apparent that our debt to it is immeasurable.

Formerly, when the dark figure of pestilence stalked abroad, people fled its approach, or cowered in fear and trembling in the corners of their dwellings, fearful lest by raising a hand they might invoke the displeasure of the terrible scourge. Travel and commerce were suspended. The habitations of the rich and lowly alike were desolated.

Leaving out of consideration the irreparable loss occasioned by the rude sundering of family ties by death, think of the pecuniary disasters sustained by each community by the destroying of its trade and the interdiction of travel. It is said that the small-pox scourge of 1871–'72 cost the city of Philadelphia not less than $21,000,000.

Now all is changed. Thanks to modern sanitary science, as developed and applied by this Association, we no longer flee in terror when a contagious disease breaks out, but turn upon it and fight it, and the victory is always on the side of the scientific sanitarian.

The number of lives that have been saved, the number of homes that have been made brighter and happier by the beneficent work of the Association, are beyond calculation.

Therefore, I say to you, all hail! dispensers of health and happiness! And may the atmosphere and surroundings of Buffalo be conducive to the furtherance of your projects, to profitable and harmonious discussions,— that the meeting here in Buffalo in September, 1896, may go down in history as one memorable for the substantial progress made along the lines of your noble and beneficent work.

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[1] Delivered at the Buffalo meeting.

This is the twenty-fourth annual meeting of your Association, and in my judgment, it is fitting that it should be held in one of the great modern cities of the continent, a city in which so much has been accomplished by adopting the teachings of your Association.

It is only five years since the modern and scientific methods of repressing disease were introduced here, yet in that time the death-rate has been reduced to an astonishing degree.

The intelligent and energetic work of our health department (supplemented by the efforts of other city departments to produce clean streets, good drainage, and an unlimited supply of pure water), has given the city a pre-eminence in the matter of public health that is one of our proudest boasts. We invite you to thoroughly investigate our city administration, and familiarize yourself with the machinery of the same and the results accomplished.

We shall welcome your criticisms, as they will point the way to improvement, where improvement is possible.

Again I wish to thank you for the honor of your visit, and as mayor of the city of Buffalo, I cordially extend to you the freedom of the city. May you be so pleasantly impressed that you will favor us with another visit before many years have rolled by!

AN ADDRESS.

By Rev. THOMAS R. SLICER, Buffalo, N. Y.

Mr. President and Gentlemen:—When a layman is asked to speak to a body of experts upon a subject which touches their field, it is becoming on his part to decline, unless he can find some points wherein their field crosses his own. I shall be perfectly safe in what I shall say to-night, in that I shall not trench upon the field of exact science, as represented by those gentlemen who have made public health a study or a life-time employment, and have gained distinction in the pursuit of that study. I am to address the Association from the standpoint of a citizen who is the beneficiary of those very conditions which your scientific knowledge has made possible; a citizen of a city in which we are proud to say, through the intelligent administration of the department with which your interests are concerned, the death-rate has been lowered very materially within the last five years. I think I am correct in saying that it has reached during the last six months the lowest point known to any city of three hundred and fifty thousand habitants. I shall speak to you from the standpoint of one who is a part of that great body politic, the citizenship of the city of Buffalo, representing in its life and history only what may be true of every other city; and what I have to offer you will be from the point of view of simply a citizen interested in his city.

The word city is the watchword of your opportunity and your danger. I think we have all had the experience of going into country districts and finding residents there breaking almost every known law of health, and yet seeming to be absolutely well. The secret of their immunity lies in the fact that by dint of exercise and abundance of fresh air in the great spaces in which their lives are set, with wholesome food that is within their reach, under conditions of honest toil, and by the aid of the great nurse, Nature, they are able to infringe on all the natural laws of health a little, and yet somehow or other feel fairly well. In the city these conditions are changed, as you have reason to know. We have added group after group in a great aggregation, the modern city, which grows too fast to allow it to observe the normal conditions of growth—groups that gather so fast that they become a peril to each other. There grow up in a narrow street tenement houses in which hundreds of families will be housed. I would have said in a den, except they are human habitations. They are crowded together under conditions which make it impossible that health should be there. They violate the four fundamental requisites of normal life,—they deny to men the simplest necessities. They are entitled to four things—that they shall have a place to live, that they shall have enough to eat, that they shall be clothed, that they shall have the privilege of being alone. These are the conditions that confront you as a great invading army, and challenge you to do your best with cities and make them even fairly healthy if you can. Here comes in the sense of the dangers that surround the expert in sanitation and in the sciences that have to do with public health. There comes to us great opportunity in city life. The sense of power is almost equal to the sense of oppression that forces itself upon us when we regard these aggregations of humanity in municipal life. The thought of what might happen if each one of them were a modern dynamo capable of discharging some power, along the currents of their life, suggests itself. I only need to remind you that when a mob breaks loose great latent powers are wrapped up there. There is not a city in America to-day that would not be better in the hands of the people, if they were organized for health and for sanitation. It is because of this sense of power that lies in the binding of lives together as the cells of a great battery, that we at once feel a sense of security and a hope of power. But more than this, there is that civic consciousness which belongs to every city. Buffalo, as an illustration, has as yet no civic consciousness. It has not the civic consciousness that marks Birmingham, Glasgow, or even Chicago, of our own nation. Buffalo has as far as we have gone with it a group of contiguous tribes. I do not now refer to their nationality, though that is also true, but to their diverse interests, to their alien training, to their want of common purpose in this city. Civic consciousness comes late in a city's life. Chicago would not have been where it is to-day in its civic consciousness had it not been for the great opportunity of the Columbian Exposition in the year 1893. But it demonstrated one thing that no city in this country has ever had the opportunity or power to demonstrate, namely, that it awarded its contracts absolutely upon the merits of the employés that were to do its work, and artists to make its designs, thus building up that wonderful White City upon the shore of Lake Michigan. This proves that one city in the United States had civic consciousness in full possession. Until the civic consciousness arrives in municipal life, it is almost, I might say, a continuous upgrade for the promoters of the public health.

The difficulties that surround your work which appeal to me as a common citizen, have been pointed out. I have touched briefly upon conditions, upon modes of life, that, if let alone, will foster conflicting interests; that, if they be not held in check, will array themselves against each other, Ishmael-like, every man's hand raised against his neighbor. You have competition, you have opposition to contend with in your line of work. These and many other conditions confront you and would discourage others with less courage than you possess. I have no doubt many of you have sat in your offices, thinking of the strong prejudices you have had to overcome and of the unconquerable stupidities over which you stumble. People no longer cry out against vaccination as an intrusion upon them; but they still cry out against the invasion of their tenements during the prevalence of epidemic diseases, whether they be landlords who are profiting by the unwholesome dwellings, or the tenants themselves. These are the conditions of ignorant people. As sanitarians, you have to remedy those conditions which lead to ill health; and these are the inevitable hindrances that lie in your way. We who are living upon clean streets do not know until we are told to protect ourselves against contagion. It is only about six months ago that an argument had to be made before a committee of the common council of this city to induce people to report cases of diphtheria and scarlet fever to the city board of health. This ought not to be so. Naturally we would think that people would report such cases to the city health authorities as a matter of course. Whatever may be done to fill the pipes of our city with clean water fit for drinking, whatever may be done to report cases of contagious disease and to devise new methods for detection, most citizens have come to understand; but there is one thing that passes the understanding of the great bulk of citizens in every great city, and that is that the health department has no business with that trough at which the politician feeds. (Applause.) Is there a man among you who has not had to fight his way for every improvement in the administration of the affairs of the health department of the city in which he lives, on account of a parsimonious administration that will refuse a thousand dollars for a bacteriologist, but which will spend two thousand dollars on a junketing trip for its aldermen and councilmen? (Applause.) It is known to you—and this is not an isolated case—that case after case has arisen where a board of health, its superintendent and other officers, have had to resort to a system of detective work in order to offset the denial of a department of the city government that typhoid germs were to be found in the drinking water. They denied it because they wished it were not so. It was proved; it had to be proved by methods indirect and circuitous, whilst human life hung quivering in the balance between the facts of pollution and the lie which denied their existence. These are not isolated instances, but they occur in every city where men single-handed have to fight their way through opposition. Through a false economy of civic administration, they have to seek the aid of private citizens. It is true that in every great city a number of people can be depended upon to aid in any new reform.

There is absolute certainty of effectual effort in a body of men equipped as you are and doing the work in which you are engaged. Observe the great joy that lies in work like yours. The household doctor feels his whole nature thrilled with delight when he takes the hand of some fever-stricken patient and leads him back into the safe way of health. But you are delivering human creatures by the score—yes, by the hundreds and thousands, from the dread of a pestilence or from conditions that make pestilences almost certain. It seems to me, no class of men should have such joy in their work as those who are occupied with matters pertaining to the public health. I congratulate you upon the progress that you have made; I congratulate you upon breaking down the prejudices to which I have referred, and of conquering very largely the ignorance which has confronted you. I think I could convince the average politician that you are on the right track in trying to deliver cities from contamination by science and not by party politics, if I could take him into the room of our board of health where the guinea-pigs are kept. He would not suppose that a guinea-pig bore any relation to politics. He would deny it if he looked upon him. But a guinea-pig in his private person is a tariff reformer for revenue only, and the guinea-pig in his inoculated condition is a protectionist. (Laughter.) If so small a creature can illustrate in his own person the principles of two great parties, why not leave the politics of the health department to him exclusively?

Finally, it is impossible that those higher attributes of human life shall prosper until men shall recognize in work such as you are doing that there is an intimate relation between that temple of the Holy Ghost, the clean and wholesome body, and that infinite spirit that delights to make its home and dwelling and temple there. (Applause.)

REMARKS.

By PETER H. BRYCE, M. D., of Toronto.

Mr. President, Ladies and Gentlemen: I have to express my extreme regret that the Honorable, the Provincial Treasurer of Ontario, who had made his engagements such that he might be present with us to-night, has in some unforeseen manner been detained, and, not having heard from him directly, I assume that he is either on the way here, or that he has overlooked the engagement in some manner or other, and that possibly we shall hear from him to-morrow.

The vice-president has called upon me to express the greetings of the Dominion of Canada in the place of the honorable gentleman to whom I have referred. I can only do so in a manner so imperfect that I shall not do more than say that our association has been so long with the American Public Health Association that we feel ourselves one with it in its aims and in the brotherhood which is represented in it and in the future of its work which has been so well begun. When I extend the greetings of Canada to the American Public Health Association, I do not extend them alone to the people of this Union, but equally to the people of the great Republic to the south of the United States. I had the pleasure of being a member of this Association when our Mexican friends became the third great member of the trinity. We have seen them coming to our meetings with increasing pleasure, and it has been gratifying to the Canadians to have helped to place a Mexican gentleman in the position which he holds to-night, that of President of this Association—Dr. Licéaga. (Applause.)

I have to thank you, Mr. President, Mr. Vice-President, and ladies and gentlemen, for the opportunity of expressing to you the greetings from Canada, and heartily thank you for the honor conferred upon me.

REMARKS.

By STEPHEN SMITH, M. D., New York.

Mr. President: Your complimentary allusions to me are very gratifying. As I stand here, very nearly a quarter of a century since the Association was first organized, it is an occasion that fills my mind with both sad and pleasurable emotions. Sad, because I miss the familiar faces of so many of the original members who labored with such zeal and self-sacrifice to lay broad and deep foundations for the Association; and pleasurable, because I see gathered from all parts of the United States, and even from the neighboring states of Canada and Mexico, so many representative men, who are rearing on their foundations a superstructure which will make the American Public Health Association the greatest power in the western hemisphere for promoting the cultivation of sanitary science, for securing wise legislation in the interest of public health, for establishing health departments in municipal, state, and the national government, and for sustaining public health authorities in the proper administration of sanitary laws. Whatever may be said complimentary of my work, may be said with greater emphasis of the work of others who were identified with the early history of this Association. I may possibly have been the first to suggest the organization of this Association, but that suggestion met with such a cordial response from the few who were then engaged in sanitary work in this country, that it was immediately apparent that such an Association was needed and that its creation was already in the minds of others. I cannot refrain from making special mention of the first secretary, and a former president, a man to whom I am more indebted, perhaps, than to any other, for advice and assistance in the preliminary work. I refer to Dr. Elisha Harris, who cheerfully bore the burden, labor, perplexity, and anxiety, attending the early steps taken in the organization of this body. It is due to his memory that I should thus acknowledge my obligations to him for whatever success has attended my efforts in the establishment of this Association. Nor can I let the occasion pass without gratefully remembering, and reverently mentioning, the early presidents of this Association, who have passed away. Truly, "their works do follow them." They were early and faithful members, and in time, attained the most honorable distinction of being chosen to the position of presiding officer of this body.

Dr. Edwin M. Snow, of Providence, was a pioneer in sanitary work in this country, and presided at the first informal meeting of those who met in the rooms of the health board in New York to consider the first steps to be taken.

Dr. John H. Rauch, of Chicago, then health officer of that city, an indefatigable worker, became our first treasurer.

Dr. Charles B. White, of New Orleans, at that time health officer of that city, and who had gained reputation by controlling yellow fever by means of cleansing and disinfection, was the first of our ex-presidents to pass away.

Dr. Ezra M. Hunt, of New Jersey, one of the most advanced students of sanitary science, was a most devoted member of the Association.

Dr. James L. Cabell, professor of surgery in the University of Virginia, and president of the National Board of Health, was among the early members who sacrificed time and means to sustain the Association in its early days.

Dr. Hosmer A. Johnson, of Chicago, was a later member, but during his membership he was deeply interested in the success of the Association.

Dr. James E. Reeves, formerly of West Virginia, but lately of Chattanooga, Tenn., author of a work on the fevers of Virginia, was an active worker in the Association from its organization till the time of his death.

And now comes the sad news of the death of Dr. Joseph M. Toner, of Washington, the second president of the Association, and one of its original members.

Nor can I forbear mentioning, in the same connection, the faithful service of Dr. Edward H. Janes, of New York, our second secretary; and of Dr. John M. Woodworth, the creator of the present Marine Hospital service.

Among the early difficulties which we encountered was the publication of our first volume. The membership of the Association was too small to raise a fund sufficient to publish such a volume as the accumulated papers demanded, and in the style which the secretary, Dr. Harris, approved. After much study of the situation, Dr. Harris and I determined to publish the transactions at our own expense, and in order to secure a print that would satisfy the fastidious taste of the secretary, we negotiated with the Riverside Press, of Cambridge, Mass., for the publication. It is very gratifying to notice that the selection of type, page, and form, made with so much care by Dr. Harris, has been continued, even to the quarterly publication, thus giving to the series a uniformity of style which makes a set of our transactions a conspicuous figure in any well-arranged library. We published the first volume at a personal cost of upwards of $1,000.00.

In the organization of the Association, great care was taken to protect it from those internal dissensions which wreck so many societies. To accomplish this object, it was determined to constitute an executive committee, which should have absolute control of all its business affairs and which should shape and direct its policy on all new questions. Every resolution, or movement, relating to the affairs of the Association, or its policy, was to be referred, without debate, to the executive committee, which had full power to suppress it altogether, or modify it in any manner the committee might deem proper, and introduce it in its modified form. New members often chafed under a rule that prevented them from bringing before the body for open and general discussion, some subject which would have given rise to sharp antagonisms, so productive of mischief, and from which no possible good could come. Twice, during my own occupancy of the presidency, the Association was saved from rupture by a strict adherence to this feature of the constitution. Another important result follows from this method of transacting the affairs of the Association, viz., the entire time of the sessions is occupied with scientific papers and discussions. Professor Gross was in almost constant attendance upon the first meeting of the Association at Philadelphia, and remarked at its close that he never attended a society which disposed of of so much scientific and so little secular matter in the same length of time.

In increasing the membership of the Association, we were very careful to select the best men that could be found. We did not aim so much at a large membership as at its quality. I recall many early members whose names have since become famous. Among these, I notice the names of President Barnard, of Columbia College; President Andrew D. White, of Cornell; Rev. Dr. Osgood, of New York; Hon. Dorman B. Eaton, president of the civil service commission; etc. These members attended our meetings, delivered public addresses, and thus gave a high character to our early proceedings. The first annual meeting was held in New York, and though there was a very small attendance, the papers and the discussions filled the next morning papers. Public interest was at once aroused and the Association was the theme of general interest. It was that larger audience beyond the immediate membership, which the Association has always reached through the publication of its papers, on which its great reputation securely rests.

There is another interesting feature of the original plan which proved most important, and added not a little to the success of the Association and to its usefulness. We allowed the committee of arrangements to organize a meeting in the city, or town, where the association met; the citizens were to conduct the meeting, and local speakers were to be engaged. The mayor was usually the presiding officer, and leading citizens of reputation in the town spoke. This was done to interest and educate the people of that particular town and neighborhood in sanitary work, and the result was quite remarkable. I remember the meeting held in Philadelphia, which was presided over by the mayor, and addresses were delivered by three prominent citizens of the town, as well as by one or two members of the Association. This meeting produced a great sensation and roused the people of that city to the importance of sanitary reforms.

The progress of the Association has been most gratifying. Apparently, there have been no errors in the management of its affairs. It has advanced from the most humble origin and beginnings to the most exalted position of any organization, of a similar character, in the world. It is especially gratifying that it has enlarged the field of its labors, including in its membership representatives from Canada and Mexico, thus giving it an international character. One of the most interesting features of the present meeting, and one that impresses me most deeply, is the large attendance of representatives from Canada and Mexico, and especially the fact that your presiding officer is one of the leading and most eminent physicians and sanitarians of the Republic of Mexico. This fact proves that international coöperation is to be the great feature of the future of sanitary work. We cannot limit the spread of world-wide epidemic diseases by mere efforts of a single nation; there must be international coöperation. Foreign nations are tending more and more to unite on common methods of procedure, in the prevention of the spread of contagious diseases. The work must be done on a large scale, commensurate with the field in which the pestilence operates.

The influence of the Association in securing international coöperation, at least on this continent, will be very great. I heartily commend this enlargement of the Association, and trust that the day is not far distant when you will include other neighboring states, with a view to restricting, if not wiping out, the most widely-spread epidemic diseases. If Cuba, with all its interests, were represented here, is it not probable that means would be devised by which the germ of yellow fever would be eradicated from the few foci where they perennially germinate? If the Central American states were brought into this alliance, you would greatly strengthen and enlarge the field and scope of the Association, and it would result in improving the sanitary condition of these countries, as well as our own. No community can be healthy that has communication with a community which, by its filthy habits, affords opportunity for the cultivation and spread of contagious diseases. Our own security against epidemics depends not only upon the cleanliness of our towns, villages, and even individual families, but even more upon the cleanliness of our neighbors, especially in such a place as Cuba, where we have yellow fever germinating and liable to be transferred to us. By means of international coöperation with contiguous nations, we might render the nations on this continent the healthiest in the world.

But I shall not take your time further. I only wish to assure you of my great pleasure on this occasion, in meeting so many old and new members, and that I fully realize that from very humble beginnings, the Association has become one of the great associations of the world. I recall the fact that when Florence Nightingale received the first report of the Association, which was sent to her, she wrote a most grateful and complimentary letter stating that she could not gather sanitary publications to send in return that would compensate her for the valuable reports of the Association. Thus has the Association sent broadcast over the country a sound sanitary literature that has created a public sentiment from which have sprung municipal and state boards of health based on correct principles. You are only in the infancy of your work, and it is our hope that you will proceed along the same lines upon which you started, broadening and strengthening as you advance. (Applause.)

OFFICIAL REPORT OF THE PROCEEDINGS OF THE TWENTY-FOURTH ANNUAL MEETING OF THE AMERICAN PUBLIC HEALTH ASSOCIATION.

HELD IN

BUFFALO, NEW YORK, SEPTEMBER 15, 16, 17, AND 18, 1896.

TUESDAY, SEPTEMBER 15TH, 1896.

FIRST DAY—MORNING SESSION.

The Association convened in the Assembly Room of the Ellicott Square, and was called to order by the President, Dr. Eduardo Licéaga, President of the Superior Board of Health of Mexico, at 10 a. m.

Prayer was offered by the Rev. Dr. Slicer, of Buffalo.

At the request of the President, Lieut-Col. Alfred A. Woodhull, U. S. A., First Vice-President, assumed the active duties of the chair, and presented to the Association its First President, Dr. Stephen Smith, of New York City, in the following language: The president has the extreme gratification of introducing to the Association its first president, and I am sure you will all be glad to have a few remarks from this gentleman to whom we are so much indebted. (See page 20.)

FIRST VICE-PRESIDENT.—I am sure I express the feelings of every member present in thanking Dr. Smith for his capital remarks concerning the early history of the Association.

We will now listen to the report of the Local Committee of Arrangements, by Dr. Ernest Wende, of Buffalo.

DR. ERNEST WENDE.—Mr. President, Ladies and Gentlemen: It gives me great pleasure to extend to you, on behalf of the Local Committee of Arrangements, a most cordial welcome to this city, and we rejoice over this gratifying consummation in the interests of the Republic of Mexico, the Dominion of Canada, and the United States of America. We are of one mind, animated by one purpose—the preservation of health. With this spirit and with this object, we again bid you welcome. (Applause.)

Your badge for this meeting of the Association, and as a token of our appreciation, consists of a buffalo, the red, white, and blue, and the whole earth.

For your confidence in our integrity and capacity, the Entertainment Committee have prepared a programme consisting of numerous coupons, a kind of currency 16 to 1, very easy to issue, but very difficult to redeem. It is unnecessary for me to enter into an explanation of these coupons, as they explain themselves. We have a reception to-morrow (Wednesday) evening; a daily ride about the city in tally-hos. This ride will give you an opportunity to see a city, which, we believe, is the finest and most beautiful city in the United States. We have also arranged to give you an elevated altitude overlooking the city from the Guarantee Building. There will be a ride about the harbor, giving you an opportunity to see the immense elevators and a harbor which nature has done so much for. Our wharves and docks are fairly good, but we cannot say we are particularly proud of them. The excursion on Saturday to Niagara Falls and other places, will be the feature of this meeting. At noon of this day, dinner will be served at the International Hotel.

This evening, you will listen to addresses to be delivered by His Honor, the Mayor, by Rev. Dr. Slicer, a third address from some prominent member of the Government of Canada, and, finally, the address of our presiding officer, Dr. Licéaga. (Applause.)

First Vice-President.—The next business in order is the report of the Executive Committee by the Secretary of the Association.

The Secretary.—The Executive Committee recommend the formation of a new committee entitled, "Committee on Sanitation with Especial Reference to Drainage, Plumbing, and Ventilation of Public and Private Buildings."

Recommendation adopted.

The Secretary.—The Executive Committee recommend a committee of five on "Disinfectants and Disinfection."

On motion, the recommendation was adopted.

Dr. Gihon.—As a member of the Executive Committee, I will say, as a matter of explanation to the members, that this committee is to be appointed for the purpose of reviving the old subject of disinfectants. Of course, the report which we issued some years ago is a standard authority on disinfectants up to that time. Since then, certain other investigations have been made, and the object of the formation of this special committee is to bring the work down to date, to supplement what our splendid committee has already done.

The Secretary reported some forty or fifty applications for membership, and the applicants were elected members.

First Vice-President.—We will now listen to the report of the Committee on Car Sanitation, by Dr. G. P. Conn, of Concord, N. H., Chairman.

The Secretary.—In the absence of Dr. Conn, Dr. Probst, of Ohio, has kindly consented to present the report in abstract.

Dr. Probst then read the report. (See Vol. XXI, p. 285.)

Dr. Domingo Orvañanos, of the City of Mexico, read a paper entitled, "Observations on the Cleaning of Railroad Passenger Cars." (See Vol. XXI, p. 300.)

Dr. Tomas Noriega, delegate from the state of Chiapas, Mexico, followed with a contribution on "The Possibilities of Contagion of Venereal Diseases in Railway Cars." (See Vol. XXI, p. 303.)

These papers were then discussed jointly by Drs. Valentine, Gihon, Kinyoun. The committee was continued.

First Vice-President.—We will now hear the report of the Committee on Steamship and Steamboat Sanitation, by Dr. Frederick Montizambert, General Superintendent of Quarantines of the Dominion of Canada.

Dr. Montizambert then presented his report, which was discussed by Drs. Horlbeck and Gihon. (See Vol. XXI, p. 309.)

First Vice-President.—I take occasion to announce what I know will be a source of regret to the Association, that Dr. Henry Sewall, of Denver, the Second Vice-President of the Association, who expected to be with us on this occasion, is seriously ill with typhoid fever, which is the unfortunate reason of his detention.

Dr. Montizambert.—With the permission of the Association, I would move that the Secretary be instructed to send a telegram to Dr. Sewall, expressing the regret of the Association at his absence. Seconded.

Dr. Wm. Bailey.—Having presided over the deliberations of this body at the Denver meeting, and knowing the good work Dr. Sewall did for us, I think this motion is in good taste, and I heartily second it, but let it be so modified as to be a telegram of sympathy and hope for his prompt recovery. Carried unanimously by a rising vote.

On motion, the Association adjourned until 3 p. m.

FIRST DAY—AFTERNOON SESSION.

The Association re-assembled at 3 p. m., and was called to order by the First Vice-President.

The report of the Committee on Animal Diseases and Animal Food was called for, but in the absence of the chairman, Dr. Salmon, it was passed temporarily.

Dr. James F. Kennedy, of Des Moines, Ia., read a paper entitled, "The Composition and Infectiousness of Milk." (See Vol. XXI, p. 333.)

At this juncture, Dr. Salmon arrived, and read his report as Chairman of the Committee on Animal Diseases and Animal Food. (See Vol. XXI, p. 329.)

The report and paper of Dr. Kennedy were then discussed jointly by Drs. Swarts, Bailhache, Lee, Hibbard, Learned, Carter, Holton, Kinyoun, and the discussion closed by Dr. Salmon.

Dr. Francisco de P. Bernalnez, of Oaxaca, Mexico, contributed a paper entitled, "Contribution to the Study of the Pathogeny, Etiology, and Prophylaxis of Typhus," which was read by Dr. Kinyoun.

The report of the Committee on Nomenclature and Forms of Statistics, by Dr. Samuel W. Abbott, of Wakefield, Mass., chairman, was read by Dr. Suiter, in the absence of the chairman.

The President, Dr. Licéaga, contributed a paper on the "Nomenclature of Diseases and Forms of Statistics," which was read by his son.

Dr. Jesus E. Monjaras, of the City of San Luis Potosi, read a paper entitled, "On the Need of Uniformity in the Meaning of the Term Still-Born."

The above report and papers were discussed by Dr. Lindsley.

At the close of Dr. Lindsley's remarks, Dr. Gihon moved that the Committee on Nomenclature and Forms of Statistics be continued, and that it be requested to undertake the compilation suggested by the chairman in his report. He said it was proper that the work should be done as the chairman suggested, and it could be done no better than by the existing committee, headed by the chairman. Dr. Gihon also suggested that Dr. Monjaras be made a member of the committee.

Motion seconded and carried.

Dr. Henry B. Horlbeck, of Charleston, S. C., read a paper on "Dengue."

Mrs. Ellen H. Richards, of the Institute of Technology, Boston, Mass., contributed a paper entitled, "Municipal Responsibility for Healthy Schoolhouses," which was read by Dr. Durgin, in the absence of the author.

On motion, the Association adjourned until 8 p. m.

EVENING SESSION.

The Association re-assembled at 8 p. m., with the President in the chair.

An address of welcome was delivered by His Honor Edgar B. Jewett, mayor of the city of Buffalo, which was followed by remarks by the Rev. Thomas Slicer, D. D., of Buffalo.

An address on behalf of the members from the Dominion of Canada was made by Dr. Peter H. Bryce, following which came the President's address by Dr. Licéaga, which was read by Dr. Gihon at the President's request.

The address, throughout its delivery, was punctuated with applause.

The Association then adjourned until Wednesday morning.

Wednesday, September 16, 1896.

SECOND DAY—MORNING SESSION.

The Association met at 10 a. m., and was called to order by the First Vice-President.

Prayer was offered by the Rev. Thomas Slicer.

Several applicants were elected to membership.

The roll of Advisory Council was called, and vacancies filled.

Mr. Rudolph Hering, C. E., of New York city, chairman, read the report of the Committee on the Disposal of Garbage and Refuse.

On motion, the committee was continued.

Col. William F. Morse, of New York city, read a paper on "Disposal of the Garbage and Waste of the Household."

Dr. N. E. Wordin, of Bridgeport, Conn., read a paper entitled "A Plea for the Domestic Disposal of Garbage," and exhibited in connection with his paper a wooden model of a household garbage and excrement crematory.

Major William S. Tremaine, of Buffalo, of the Medical Department, U. S. Army (retired), made some impromptu remarks on the "Disposal of Household Garbage and Excrement by Cremation."

The report and papers on the disposal of garbage were then discussed by Drs. Gihon, Sternberg, Clark, Varian, Carter, Mitchell, Durgin, Howe, Lewis, Bell, and in closing, by the essayists.

Dr. Charles O. Probst, of Columbus, O., chairman, read the report of the Committee on "Transportation and Disposal of the Dead," which was followed by a paper by Dr. Benjamin Lee, of Philadelphia, entitled "The Quick or the Dead."

Discussed by Dr. Durgin, and in closing, by Dr. Probst.

Dr. Stephen Smith offered the following resolution, which was read by the Secretary:

WHEREAS, Information has been received that the state of Tennessee will celebrate the centennial of its adoption into the Federal Union, during the six months beginning May the first, 1897, by an Exhibition of the progress and present condition of the various departments of human industry in this country; and

WHEREAS, It is proposed by the directors of the Exhibition to give special prominence to the improvements in the department of hygiene,

Resolved, That the American Public Health Association cordially approves of the proposed Exhibition as being one of the most practicable and effective means of diffusing sanitary knowledge among the people.

The resolution was referred to the Executive Committee.

THE SECRETARY.—I have another resolution, introduced by Major Smart, which I will read.

The Secretary then read the following resolution, which was referred to the Executive Committee:

Resolved, That a committee be appointed to consider and report upon some method of international arrangement for protection against the transmission of infectious diseases.

On motion of Dr. Gihon, the Association adjourned until 3 p. m.

AFTERNOON SESSION.

The Association re-assembled at 3 p. m., and was called to order by the First Vice-President.

Dr. Augustin Chacon, Mexico, Mexico, read a paper entitled "Measures for the Prevention of Blindness," which was discussed by Drs. Howe and Valentine.

THE SECRETARY.—I have resolutions in connection with the paper just presented which I will read.

The Secretary then read the resolutions, as follows, which were seconded, and referred to the Executive Committee without discussion:

By Dr. Henry Mitchell:

WHEREAS, The procedure known as Crede's method for the treatment of purulent ophthalmia of infancy has been found to lessen the number of sufferers from that dreaded disease much more surely than any other method thus far known; therefore:

Resolved, That this Association recommend the passage of laws which will compel all physicians and accouchers in institutions supported in part or wholly by public funds, to employ this method for every new-born child.

By Dr. Lucien Howe:

WHEREAS, About one fifth of all the inmates of schools and asylums for the blind are there because of having suffered from purulent ophthalmia of infancy; and

WHEREAS, The ravages of this disease can be controlled in almost every case, if proper treatment is begun promptly; and

WHEREAS, Most of this blindness is due to the wilful or ignorant neglect of nurses and midwives, thus causing unspeakable misery to the innocent victims, and great yearly cost to the state; therefore,

Resolved, That this Association heartily approves of the laws already enacted in several states which compel midwives and nurses to report these cases under heavy penalty, immediately, to legally qualified practitioners or to proper officers of local boards of health; and

Resolved, That this Association earnestly recommends and urges the adoption of similar laws in other states of the Union or elsewhere, wherever practicable.

Dr. Alberto G. Noriega, delegate from the state of Sonora, Mexico, read a paper on "Miasmatic Fevers in the State of Sonora"; and Dr. Maximiliano Alverez, delegate from the state of Mexico, followed with a paper entitled "Summary of Sanitary Legislation in the State of Mexico."

The President called for the report of the Committee on National Health Legislation, Dr. Henry P. Walcott, of Cambridge, Mass., chairman, when Dr. Wingate, as a member of the committee, arose and said: "Dr. Walcott is unable to be present, and, after consultation with some of the members of the committee, I have a resolution to offer favoring the establishment of a Bureau of Public Health at Washington."

The resolution was then read, and is as follows:

Resolved, That it is the sense of this Association that the Committee on National Sanitary Legislation be continued; and that efforts be continued to influence the congress of the United States to establish a Department of Public Health at Washington, D. C.; and to this end it is recommended that the powers of the marine hospital service be enlarged and so organized as to provide for an advisory council composed of representatives from the state boards of health.

The resolution was seconded, and referred to the Executive Committee without debate.

Dr. Coventry.—I have a resolution to offer which is germane to the subject of legislation. It is as follows:

Resolved, That this Association views with pleasure the growing tendency in many states and provinces to manage and control the bureaus of public health without political partisanship and not to exclude from office sanitarians who may differ politically from the party temporarily in power. From a scientific standpoint, as well as in the best interests of public health, we approve this tendency, and take this opportunity to place ourselves on record by declaring that it is subservient of the best interests of the public health not to recognize political lines in the formation of state, provincial, or other boards of health, and that a copy of this resolution be sent to the secretaries of state and to all state, federal, and provincial governments of the countries represented in this Association.

Seconded and referred to the Executive Committee without discussion.

Dr. Sternberg.—As some resolutions have been introduced, and as I am obliged to leave the city this evening, I ask permission to make a motion, if the Association will grant it, and it requires just a few words of explanation. I am a member of a committee organized for the purpose of raising funds in this country for a memorial monument to Pasteur. A committee consisting of leading scientific men in France, and men connected with the government and with the French Academy of Sciences, constitutes the committee in France. They have extended an invitation to this country through Dr. Saunders of the Agricultural department, who is chairman of the committee and has organized a National Committee to collect funds. The various associations have been called upon, and many of them have already responded, and I have no doubt others will. I presume our treasury will not permit us to make an appropriation, but my motion is, that the Secretary of this Association be instructed to accept the contributions of the members, and to transmit the amounts to the treasurer of the National Committee. If the members only contribute a small amount, say a dollar each, it would make a generous donation from this Association, and we shall be properly represented. The French people do us a favor in asking us and other nations to assist them because they consider the memorial monument to Pasteur is to be erected by the scientific men of the world, and not alone by France. I hope the Association will do something that is creditable to itself.

Seconded.

Dr. Gihon.—I desire to offer an amendment to the motion, prefacing it by two or three words of explanation. I have been for eleven years chairman of the Rush Monument Committee of the profession of medicine in the United States, and I have not collected more than about $4,000; yet in the course of three years, a little body of six thousand homeopaths have raised $75,000, for the erection of a beautiful monument in this country to Hahnemann. Now, right on top of my efforts to get money to build a monument creditable to the profession of the United States, an appeal is made for contributions to erect a monument to Pasteur, and the amendment which I desire to offer is, that for every dollar contributed towards a monument to Pasteur ten shall be contributed for a monument to Benjamin Rush—the greatest physician and sanitarian that this country has ever produced. (Applause.) I received the other day from the Academy of Medicine of New York, a printed appeal to contribute to the monument of Pasteur, and I felt like resigning from that Academy, but I shall inform the secretary I will remain another year in order to tell the Fellows of the Academy that we should erect a monument to Benjamin Rush before we build one to any other man.

Seconded.

First Vice-President.—It seems to me we are getting out of order. When I accepted the original motion, I supposed it referred to the subject under consideration, and not to Benjamin Rush. Are there any other remarks to be made?

There being no further remarks, the Chair put Dr. Sternberg's motion, which was carried.

Dr. Gihon.—Now, I would offer a resolution substituting the name of Benjamin Rush for Pasteur.

The resolution was referred to the Executive Committee without discussion.

Dr. A. Walter Suiter, of Herkimer, N. Y., read a paper entitled "Obiter Dicta Concerning Sanitary Organization."

Dr. U. O. B. Wingate, of Milwaukee, Wis., read a paper on "Some Thoughts Relative to National Health Legislation."

Dr. Henry Mitchell, of Trenton, N. J., read a paper entitled the "Sanitary Administration of Unincorporated Districts."

These papers were then discussed by Drs. Hoadley, Calvary, Jones, Bryce, Lee, Carter, Lewis, and in closing, by Dr. Mitchell.

Dr. Mitchell offered the following:

Resolved, That a committee of five be appointed by the Association to examine into the existing sanitary organizations of the countries belonging to this Association, with a view to report upon those systems as have proved most successful in practical results.

Seconded, and referred to the Executive Committee.

Dr. Felix Formento, of New Orleans, La., chairman, read the report of the International Committee on "The Prevention of the Spread of Yellow Fever."

A paper entitled "Contribution to the Study of Yellow Fever from a Medico-Geographical Point of View," was read by the President, Dr. Licéaga, followed by one entitled "A Contribution to the Study of Yellow Fever Epidemic in Cordova," by Dr. Gregorio Mendizabal, of Orizaba, Mexico.

On motion, the Association adjourned until 8 p. m.

EVENING SESSION.

The Association reassembled at 8 p. m., with the President in the chair.

Dr. John L. Leal, of Paterson, N. J., read a paper on "Isolation Hospitals," which was illustrated by diagrams.

The paper was discussed by Drs. Lindsley, Barns, Plunket, Wright, Probst, Woodward, Hibberd, Gihon, Durgin, Woodhull, and the discussion closed by Dr. Leal.

On motion of Dr. Montgomery, the Association adjourned until Thursday morning.

THURSDAY, September 17, 1896.

THIRD DAY—MORNING SESSION.

The Association met at 10 a. m., with the President in the Chair.

Announcements were made by the Chairman of the local Committee of Arrangements, after which the annual report of the Treasurer of the Association, by Dr. Henry D. Holton, was read. (See page 45.)

FIRST VICE-PRESIDENT.—The Auditing Committee will consist of Mr. Gray, and Drs. Kennedy and Coventry. The committee will report at the meeting to-morrow morning.

The next business in order is the report of the Executive Committee through the Secretary.

THE SECRETARY.—Mr. President, the Executive Committee recommend that the Treasurer be authorized to appoint an assistant Treasurer for the Republic of Mexico.

Seconded and carried.

THE SECRETARY.—The Executive Committee have considered the resolution offered by Dr. Smart, and recommend its adoption. (See page 29.)

Resolution adopted.

THE SECRETARY.—The Executive Committee have considered the resolution offered by Dr. Coventry, and recommend its adoption. (See page 31.)

Adopted.

THE SECRETARY.—The Executive Committee have examined the resolution offered by Dr. Wingate, and recommend its adoption as amended, to wit:

Resolved, That it is the sense of the Association that the Committee on National Sanitary Legislation be continued, and that efforts be made to influence the congress of the United States to establish a Department of Public Health at Washington, D. C.

Adopted.

THE SECRETARY.—I have here a resolution embodying the recommendations contained in the president's address, as follows:

WHEREAS, Isolation is not required to be equally strict for all diseases, and

WHEREAS, The method of practising disinfection must also be different with respect to each contagious disease, and

WHEREAS, The technique of disinfection demands a special study, therefore

Resolved, That a committee of five be appointed by the Association to study the period or periods during which each contagious disease is transmissible, and the time during which every patient who has suffered from such disease is dangerous to the community.

Adopted.

FIRST VICE-PRESIDENT.—The committee will consist of, as chairmen, Drs. Licéaga, John L. Leal, Fernando Lopez, Newton L. Bates, and J. J. Kinyoun.

THE SECRETARY.—The Executive Committee have considered the resolutions offered by Drs. Mitchell and Howe, and recommend the adoption of that offered by Dr. Howe. (See page 30.)

Adopted.

Several persons were elected to membership.

Major Charles Smart, surgeon of the United States Army, Washington, D. C., as chairman, read the Report of the Committee on Pollution of Water-supplies. (See Vol. XXI, p. 312.)

Dr. Peter H. Bryce, of Toronto, chairman, read the Report of Committee on River Conservancy Boards of Supervision. (See Vol. XXI, p. 316.)

Dr. Charles N. Hewitt, of Red Wing, Minn., as chairman, read the Report of Committee on Protective Inoculations in Infectious Diseases, which was discussed by Dr. Licéaga.

FIRST VICE-PRESIDENT.—I have a very gratifying announcement to make. "The Association's telegram has afforded Dr. and Mrs. Sewall much gratification. The doctor has typhoid fever, and is progressing favorably thus far. Signed, Dr. Samuel A. Fiske."

Dr. Wyatt Johnston, of Montreal, bacteriologist to Provincial Board of Health of Quebec, read a paper on "The Serum Diagnosis Test for Typhoid Fever."

Dr. John Eliot Woodbridge, of Cleveland, O., followed with a paper entitled "Prophylaxis of Typhoid Fever."

The papers were discussed by Drs. Carmona y Valle, Kinyoun, Learned, Bailey, and discussion closed by the authors of the papers.

Dr. Durgin offered the following resolutions:

The American Public Health Association assembled in annual session at Buffalo, N Y., September 15-18, 1896, desires to present to the congress of the United States its disapproval of such legislation as may have for its object the arrest or curtailment of the biological investigations which are being conducted at Washington in the laboratories connected with the U. S. Marine Hospital Service, the offices of the Surgeons General of the United States Army and of the Navy, and the Bureau of Animal Industry of the

Department of Agriculture. The results of their investigations have already been of great value in the prosecution of sanitary work throughout the country, and even better results are anticipated in the near future. Therefore be it

Resolved, That this Association is of the opinion that such legislation by congress would be unwise and a great hindrance to the advancement of sanitary science, and, while opposing needless cruelty and experiments upon animals in the public schools, this Association believes that those who are trained in the special line of research necessary for the humane conduct of the work referred to, should not be hindered in the prosecution of their work.

Resolved, That a copy of these resolutions be sent to the members of the house and senate of the United States Congress, and also to the president of the United States.

Seconded and referred to the Executive Committee.

Dr. Franklin C. Robinson, of Brunswick, Me., read a paper entitled "Practical Use of Formic Aldehyde as a Disinfectant." (See Vol. XXI, p. 356.)

On motion of Dr. Gihon, the Association adjourned until 3 p. m.

AFTERNOON SESSION.

The Association re-assembled at 3 p. m., with the President in the chair.

FIRST VICE-PRESIDENT.—There are certain resolutions which will be read in due course and referred to the Executive Committee. The first resolution is by Dr. Lee, of Philadelphia, which will now be read:

WHEREAS, In their several reports, our International Committee on the Prevention of the Spread of Yellow Fever, has shown the necessity of international co-operation for the eradication of that disease. Be it

Resolved, That a memorial be addressed by this Association to the president of the United States, requesting him to invite through the channels of diplomacy, the governments of Cuba, Mexico, and the Central and Southern American Republics, to adopt in their respective countries such sanitary measures as will tend to the eradication of yellow fever, and to co-operate with the United States government in any movement designed to accomplish this most important object.

The following resolution was offered by Surgeon-General Wyman:

WHEREAS, Yellew fever is believed to be the most subtle and dangerous of all epidemic diseases, and

WHEREAS, It is ordinarily conveyed into one country from an infected seaport of another, and

WHEREAS, The continued and persistent presence of this disease in any seaport is believed to be unnecessary, and may be prevented by proper engineering and other sanitary measures, therefore

Resolved, 1st, That it is the duty of every government possessing seaports thus infected, to institute such engineering and other sanitary measures as will remove this menace to the seaports of other nations, and

Resolved, 2d, That it is the duty of all governments continuously threatened with invasion of yellow fever from a seaport in which the disease is allowed to persist, to make representations to the government in possession of the offending seaport as will cause the latter to adopt the sanitary measures necessary to remove this obstruction to commercial intercourse and menace to human life.

Dr. F. W. Wright offered the following resolution :

> WHEREAS, It has been conclusively shown that typhoid fever has been caused by oysters that have been freshened in streams polluted with sewerage,
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> *Resolved*, That this Association condemns the practice of many oyster growers of placing oysters to be freshened in streams polluted with sewerage, and recommends that the State Boards of Health of the several states interested endeavor to have laws adopted by their respective legislatures prohibiting this practice.

Referred to the Executive Committee without discussion.

The Report of Committee on the Cause and Prevention of Diphtheria, was read by Dr. J. J. Kinyoun, of Washington, D. C., chairman.

Dr. Miguel Marquez, delegate from the state of Chihuahua, Mexico, read a paper entitled, " Diphtheria in Chihuahua."

Dr. E. B. Shuttleworth, of Trinity Medical College, Toronto, read a paper on " Bacteriological Diagnosis as Governing the Admission and Discharge of Patients in Diphtheria Hospitals."

The papers were discussed by Drs. Woodhull, Lyons, Hurty, Carter, Miller, Hopkins, Lee.

Dr. E. A. DeSchweinitz, of Washington, D. C., read a paper entitled, "A Convenient Lamp for Generating Formaldehyde Gas." (See Vol. XXI, p. 362.)

Dr. J. J. Kinyoun, of Washington, D. C., followed with a " Preliminary Note on the Use of Formaldehyde for Room and Car Disinfection."

A paper on " Prophylaxis of Paludism," by Dr. Alfonso Ruiz Erdozain, delegate from the State of Hidalgo, Mexico, was read.

Dr. Angel Gavino, delegate from the State of Morelos, Mexico, read a paper entitled, " Paludism in the State of Morelos, and Its Prophylaxis by Sanitary Measures."

Dr. Juan Muldson, delegate from the State of Tabasco, Mexico, read a paper entitled, " Public Health in Tabasco."

A paper on " Sanitation in Hospitals for the Insane," by Dr. George H. Rohe, of Skyesville, Md., was read by title.

Dr. Henry M. Bracken, Minneapolis, Minn., read a paper entitled, " Should Measles Be Quarantined ? "

Dr. Charles N. Hewitt, of Red Wing, Minn., chairman, read the Report of the Committee on Causes and Prevention of Infant Mortality.

Dr. Salvador Garciadiego, delegate from the State of Jalisco, Mexico, contributed a paper " On Mortality of Infants, the Causes and Means of Diminishing It."

Dr. José M. Benitez, delegate from the State of Guadalajara, Mexico, read a paper " On Diarrhoea of Children."

On motion, the Association adjourned until 8 p. m.

EVENING SESSION.

The Association re-assembled at 8 p. m., with the President in the chair.

Dr. Felix Formento, of New Orleans, chairman, read the Report of Committee on the Use of Alcoholic Drinks from a Sanitary Standpoint.

The report was discussed by Drs. Carter, Bailey, Woodhull, Hopkins, and the discussion closed by Dr. Formento.

Dr. Albert L. Gihon, Medical Director of the United States Navy (retired), read a paper on "The Bicycle in its Sanitary Aspect."

The discussion was opened by Dr. Carter and continued by Dr. Mosher, the discussion being closed by the essayist.

Dr. Carlos Santa-Maria, delegate from the State of Durango, Mexico, read a paper "On the Part that Public Instruction Should Have in the Way of Precaution Against Contagious Diseases."

Dr. H. Lincoln Chase, of Brookline, Mass., read a paper entitled, "Public Bathing Establishments, with a Description of the New Public Bath in Brookline."

This paper was followed by one on "Public Baths, Illustrated by Stereopticon," by Dr. W. H. Tolman, of New York city.

On motion, the Association adjourned until Friday morning, 10 o'clock.

FRIDAY, September 18, 1896.

FOURTH DAY—MORNING SESSION.

The Association met at 10 a. m., and was called to order by the President.

The first thing in order was the report of the Executive Committee by the secretary.

THE SECRETARY.—The Executive Committee have considered the resolution offered by Dr. Mitchell, and recommend its adoption. (See page 32.)

On motion of Dr. Gihon, it was adopted.

THE SECRETARY.—The Executive Committee also recommend the adoption of the resolution offered by Dr. Wyman, in the following form:

> WHEREAS, Yellow fever is believed to be the most subtle and dangerous of all epidemic diseases, and
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> WHEREAS, It is ordinarily conveyed into one country from an infected seaport of another, and
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> WHEREAS, The continued and persistent presence of this disease in any seaport is believed to be unnecessary, and may be prevented by proper engineering and other sanitary measures, therefore
>
> *Resolved, 1st*, That it is the duty of every government possessing seaports thus infected, to institute such engineering and other sanitary measures as will remove this menace to the seaports of other nations, and
>
> *Resolved, 2d*, That it is the duty of all governments continuously threatened with invasion of yellow fever from a seaport in which the disease is allowed to persist, to make

representations to the government in possession of the offending seaport as will induce it to adopt the sanitary measures necessary to remove this obstruction to commercial intercourse and menace to human life.

Resolved, That a copy of these resolutions be transmitted to the executives of the several governments represented in this Association.

Adopted.

The Secretary.—The Executive Committee have considered the resolution offered by Dr. Durgin, and recommend its adoption. Adopted. (See page 34.)

The Secretary.—The Executive Committee recommend the continuation of the Committees on the Pollution of Water-supplies; on the Disposal of Garbage and Refuse; on Animal Diseases and Animal Food; on Nomenclature of Diseases and Forms of Statistics; on Car Sanitation; International Committee on the Prevention of the Spread of Yellow Fever; on Steamship and Steamboat Sanitation; on the Transportation and Disposal of the Dead; on the Relation of Forestry to Public Health; on Transportation of Diseased Tissues by Mail; on River Conservancy Boards of Supervision.

Committees continued.

The Secretary.—The Executive Committee recommend that the Committees on Protective Inoculations in Infectious Diseases, and on the Cause and Prevention of Diphtheria, be consolidated with the title "On the Causes and Prevention of Infectious Diseases."

Carried.

The Secretary.—The Executive Committee recommend that the following Committees be discontinued: on the Use of Alcoholic Drinks from a Sanitary Standpoint; on the Centennial of Vaccination.

Carried.

Several persons were elected to membership.

Dr. Wright.—What becomes of resolutions not reported upon? Are they killed in the Executive Committee?

First Vice-President.—Resolutions referred to the Executive Committee which have not been reported back to the Association, are regarded as having been laid on the table in the Executive Committee and smothered. Whether that is true in every particular instance, I do not know. There may be an oversight by which some resolutions have not been reported, but as to this I cannot say. If the gentleman will mention the resolution he has in mind, the Association will better understand the matter.

Dr. Bailhache.—What is the use of the Association if the Executive Committee is going to tell us what we have got to do? I think it is a mistake to lay resolutions aside or pigeon-hole them.

Dr. Wright.—I offered what I consider a very practical resolution, [see page 36] one which interests the whole country, and it was with reference to oysters and streams being contaminated by sewage. Now, if the Executive Committee have seen fit to consider this resolution unfavorably, I wish it to be known that this Association puts itself on record as favoring the placing of oysters in contaminated streams.

Dr. Gihon.—The Committee thought a better plan would be to avoid polluting the waters; then the oysters would be all right.

Dr. Wright.—The remark of Dr. Gihon is all right so far as it goes. But these streams are polluted by sewage from several cities, and one I have particularly in mind, and it would be a big job to get a bill through any legislature, but if this matter could be endorsed by the Association as a body, it would have great influence upon several state legislatures towards passing an act of that kind.

First Vice-President.—Notwithstanding the very late hour at which the committee held its meeting, this resolution was carefully and thoroughly considered, and the Executive Committee gave it their best judgment. The resolutions which have been reported are only those which the Executive Committee are authorized to report. We are all human and may err. I am not speaking in defense of it; in a meeting of this kind, these matters should be fully explained, and I know of no remedy for errors or omissions of that sort. As the matter stands now, it does not commit the Association to an affirmative view.

Dr. Wright.—I desire to make a motion that the resolution be brought before the Association.

Seconded.

Dr. Plunket.—I wish to know if the Executive Committee in making their reports are not supposed to report upon matters that they reject, giving their reasons therefor. It occurs to me that there is a by-law which covers this point. It is eminently proper that the Association or an individual member should understand why these resolutions are disposed of, and the reasons given therefor. I believe this is the custom in all parliamentary bodies. If we have no by-law covering this point, it seems to me it is time to amend the by-laws, and ——

First Vice-President.—There is a motion before the house that the resolution regarding the pollution of oyster streams be brought before the Association for its consideration.

Dr. Holton.—Will not the gentleman correct his motion so as to recall the resolution from the Committee? It is necessary to do this before it can be properly brought before the house.

Dr. Wright.—I accept the suggestion.

First Vice-President.—The chair would be glad to hear from some older member of the Association, some member who is accustomed to the workings of this body, preferably an ex-president, who knows what the rule of the Association is. The chair has acted on what he has supposed to be the rule, and if an error has been made by the Executive Committee it is well to know it. I am sure the Association would like to hear from Dr. Montizambert.

Dr. Montizambert.—Mr. President, as I understand the matter, the Executive Committee stand between this Association and hasty legislation. It is not a star-chamber in any sense of the term. It is your own committee whom you elect yourselves from representatives on the advisory council, and if it does not do its duty you appoint somebody else. The rule of the Association has always been that resolutions are referred to the Executive Committee for the purpose of preventing hasty or unwise legislation, and then the results of the labors of the Committee are reported back to the Association as a body.

First Vice-President.—It is quite well known that we are not a body of acute parliamentarians, and our object is to despatch public business for the benefit of the greatest number. The chair decides that the motion which was made is out of order. It now becomes necessary for you to take an appeal from the decision of the chair to determine whether it is in order. If the Association insists that the motion is in order, then the matter will become debatable. But the chair decides that the motion just made to recall this resolution from the Executive Committee and bring it before the Association now, so far as the Association is concerned, is out of order. We must take a vote upon it, and the question is, Shall the chair be sustained ?

A vote was then taken, and the Chair was sustained in his ruling.

The Secretary.—The Association has voted to allow the treasurer to appoint a sub-treasurer for the Republic of Mexico in order to facilitate financial matters, and he has appointed as his assistant Dr. Domingo Orvañanos, of Mexico.

Mr. Crosby Gray read the following report of the Advisory Council :

Buffalo, N. Y., September 17, 1896.

To the President and Members of the American Public Health Association :

Gentlemen,—I am directed by the Advisory Council to report to your honorable body the nomination by it of the following officers and members of the Executive Committee for service during the ensuing year, viz. :

For President.—Dr. H. B. Horlbeck, of Charleston, S. C.

For First Vice-President.—Dr. P. H. Bryce, of Toronto, Canada.

For Second Vice-President.—Dr. Ernest Wende, of Buffalo, N. Y.

For Treasurer.—Dr. Henry D. Holton, of Brattleboro, Vt.

Executive Committee.—Dr. Henry Mitchell, of Asbury Park, N. J.; Dr. U. O. B. Wingate, of Milwaukee, Wis. ; Dr. Jesus Monjaras, of Mexico.

The council had presented before it a number of written and oral invitations to hold the next meeting of the Association in the cities named, and after careful consideration of the claims presented, decided to recommend the city of Toronto, Canada, as the place in which to hold said meeting.

Respectfully submitted,

Crosby Gray,

Secretary, Advisory Council.

On motion, all of the report was adopted with the exception of that part pertaining to the place of meeting, namely, Toronto.

Dr. Plunket moved, as an amendment, that the word Toronto be stricken out, and Nashville substituted as the place of meeting.

Seconded by Dr. Hibberd.

Dr. Benjamin Lee offered an amendment to the amendment, substituting the name of Philadelphia for Nashville.

Seconded.

After a spirited discussion, participated in by Drs. Bell, Lee, Gihon, Durgin, Sheard, Bracken, the commissioner of Toronto, and Carter, Philadelphia was selected as the place of meeting.

First Vice-President.—We will now listen to the report of the Auditing Committee.

Mr. Gray.—Your committee, to which was referred the report of the treasurer for the past year, begs leave to report that they have compared it with the books and vouchers, and find it to be correct.

Respectfully submitted,
Crosby Gray,
J. F. Kennedy,
J. W. Coventry,
Auditing Committee.

On motion, the report of the Auditing Committee was adopted.

The secretary then announced the committees for the coming year.

First Vice-President.—It is now in order to receive miscellaneous business, amendments to the constitution, etc.

Dr. Wright.—I have an amendment to the Constitution that I wish to offer, and it is as follows :

On and after the next session of this Association (1897), the Executive Committee shall consist of nine members, who shall be elected by the Association, three of whom shall be elected annually.

(Laid over for one year.)

Dr. Cerna.—*Mr. President and Members :* I have the honor to represent Drs. Licéaga and Carmona, and in their name I take great pleasure in extending to the Association a most cordial invitation to attend the meeting of the Pan-American Medical Congress which takes place in the city of Mexico in November next. I have nothing to add, except to assure you that you will receive a hearty welcome, and that the Mexicans will take care of you. (Applause.)

The chair appointed Drs. Gihon and Formento as a committee to escort the newly-elected president, Dr. Horlbeck, to the platform.

Dr. Horlbeck was warmly received in ascending the platform. He said : "If this is the time to make my acknowledgments to you, I do so with great sincerity and gratitude. I have been one of your colleagues for sixteen years. I have labored with you, enjoyed your pleasures, and now you have seen fit to make me your president. It is a compliment to my city and state, that I, as a health officer, should receive such a distinction at the hands of such a body—a body known all over the world for its splendid work ; a body that is the beacon light of progressive sanitation. The character of our work has been recognized.

"We have next year a remarkable episode in the history of the Association. It will be our twenty-fifth anniversary. We shall then celebrate our Association, which commenced with less than a dozen members. We have had from time to time from seven to eight hundred men representing the best states and cities of three great governments—The United States, the Dominion of Canada, and the Republic of Mexico. We have worked together as a band of brothers, and have worked most successfully. Next year will be our twenty-fifth anniversary, and it will be becoming that we should celebrate it in a manner worthy of the occasion. We will meet in a historical city, a centennial city, a city that has been the mother of the medical profession, a city where Benjamin Rush was born, and where he succeeded and was perhaps the Nestor of the American profession at that time. Philadelphia has contributed a good deal to the advancement of medical science, and I think it will be becoming that we should use our best endeavors at our meeting in 1897. I ask your support because my labors will be as nothing without it. I can pledge you, for myself, my best zeal, my best earnestness, and my best intelligence. I shall so work that I hope you will be able to say when our labors are over, 'Well done thou good and faithful servant,' you have fulfilled your trust." (Applause.)

Dr. Licéaga addressed the Association in Spanish, and his remarks were subsequently translated by Dr. Cerna, as follows :

"*Mr. President, Ladies and Gentlemen :* Dr. Licéaga wishes to express his most sincere thanks for the distinguished honor which you have conferred upon him in electing him the president of this Association. He believes that his election in this instance has shown a tendency on the part of American physicians not only to form a bond of union in medical science, but also to form a bond of union between the Republic of Mexico and the United States. (Applause.) He feels that there can be no higher wish than that of forming an immortal bond of union between these two great countries. He has been highly gratified with the work of the Association, and although he has been unable to preside personally over the deliberations of this meeting, owing to his lack of the English language, yet he has been highly satisfied with the honor that has been conferred upon him—an honor which he does not appreciate personally so much as he does for Mexico in general. He assures you that Mexico takes great interest in the development of this Association, and also in the development and bringing about of this bond of union between the United States and Mexico; and although the Mexican delegation is not a large one, he wants you to understand that each member represents a state in the Republic of Mexico, therefore the whole Republic of Mexico is represented by our delegation. (Applause.)

"He also wishes to congratulate the Association upon the selection of Col. Woodhull as the first vice-president. He thinks you could not have made a wiser selection.

"Finally, he thanks you for the honors conferred upon all and each one of the members belonging to the Mexican delegation—distinctions and honors which they all appreciate, and in their name, and in the name of the Republic of Mexico, he again expresses to you his most cordial thanks." (Applause.)

Dr. Gihon offered the following resolutions of thanks, which were unanimously adopted:

Resolved, That the thanks of the American Public Health Association be tendered to Dr. Ernest Wende, chairman of the Local Committee of Arrangements, and to his associates upon that committee, for the admirable way in which they have provided for its entertainment in Buffalo, for the beautiful and unique badge of membership they had prepared, and the novel and exceedingly convenient booklet of detachable coupons for members' use, and for the handsome souvenir brochure prepared for them by Dr. William Warren Potter; to his Honor, the Mayor of the city of Buffalo, the Hon. Edgar B. Jewett, and to the Rev. Thomas L. Slicer, D. D., for their addresses of welcome; to Dr. and Mrs. Lucien Howe and the members of the Committee on Entertainment and Reception for their courtesies to the members and ladies accompanying them; to the members of the Ellicott club for their hospitality; to the Cereal Machine company for the luncheon tendered the Association during its excursion on the lake; and lastly, to the press of Buffalo for its full and admirable reports of the proceedings of the Association at a time when three other conventions were in session in the city, and which further demonstrated its interest in our behalf by sending us the "fairest flowers" of its reportorial staff.

First Vice-President.—I thank the Association not merely for their kindly expressions of opinion, but for their kindly co-operation in the discharge of my duties. I have never discharged such duties before, and unless the Association had gone along with me there would have been no end of trouble.

Dr. Henry Mitchell, of Trenton, N. J., as chairman, read the Report of Committee on Transportation of Diseased Tissues by Mail, and asked to have the committee discharged.

First Vice-President.—Instead of discharging the committee, we will continue it with Dr. LaChapelle as chairman, and other gentlemen of experience will be his assistants.

Dr. Lee.—I desire to offer a resolution in this connection, and in doing so I wish to say that I do not believe the members of this Association know how much good work has been done by the committee that has just made its report, or what advantages have been obtained from the United States government. In Pennsylvania we feel indebted to this committee for the work which has been done.

The secretary then read the resolution by Dr. Lee, as follows, which was adopted:

Whereas, The action of the Hon. William L. Wilson, postmaster-general of the United States, in permitting the use of the mails, under suitable restrictions, for the transmission of diseased tissues, for bacteriological examination, for diagnosis in cases of suspected contagious disease, has made possible the extension to nearly all portions of the United States of the services of public laboratories for the early detection of this dangerous class of diseases, therefore be it

Resolved, That the American Public Health Association hereby expresses its appreciation of the advanced scientific discernment which has led the postmaster-general to apply the facilities of the postal service to the promotion of the public health.

Dr. José Ramirez, delegate from the State of Yucatan, Mexico, read a paper entitled "On Statistics of Vaccination and Mortality from Smallpox in the City of Mexico."

Dr. A. Nelson Bell, of Brooklyn, N. Y., read a paper entitled "Drunkenness a Vice: It Should be so Treated."

A paper entitled "Municipal Cattle and Meat Inspection," by Dr. Peter H. Bryce, of Toronto, was read by title.

Dr. Francisco Martinez Baca, delegate from the State of Pueblo, Mexico, read a paper on "The Prophylaxis of Scurvy in Prisons by Pulque," which was discussed by Drs. Bryce, Woodhull, and Cerna.

Dr. William C. Krauss, of Buffalo, N. Y., read a paper on "The Relation of Noises to Public Health," and Dr. J. B. Learned, of Florence, Mass., one on "The Degeneration of the Human Animal Through the Nursery and School."

Mr. Lawrence Irwell, of Buffalo, read a paper on "Racial Deterioration."

Dr. Ferdinand C. Valentine, of New York city, read a paper entitled "The Protection of the Innocent from Gonorrhoea."

The following papers were read by title: "The Necessity of Isolating Beds in Hospital by Means of Windows Between Them," by Dr. Jesus E. Monjaras, of San Luis Potosi, Mexico. "Filth Deposits with Regard to Public Health," by Drs. José D. Morales, R. E. De Guerrero, of Mexico.

Dr. Gihon.—I think we can congratulate ourselves that we have gone through this extensive programme, and have not omitted a single paper. It is unparalleled in the history of this body. Now that our work is over, before adjourning I wish to say that I have deferred until the last moment, the formal announcement to the Association of the sad intelligence of the death of two of its oldest and most zealous and eminent members—one a founder of the Association and its second president; the other a member of the advisory council, who, since 1878, has never been absent from a meeting of the Association at which he could be present, and who, I know, had looked forward to within a few weeks of his death with pleasurable expectancy to be with us on this occasion. I beg to offer the following resolution:

Resolved, That the American Public Health Association place on record its sense of its irreparable loss in the decease of its founder and second president, Dr. Joseph M. Toner, of the city of Washington, D. C., and of its senior member of the Advisory Council, of the state of Alabama, Dr. Jerome Cochrane, of Mobile, Alabama.

The resolution was seconded by Dr. Valentine, and unanimously adopted by a rising vote.

First Vice-President.—I am sorry I omitted to say what I intended on a previous occasion, but I will do so now. I have necessarily been very much in evidence at this meeting, although the actual president of the Association has presided and has kept himself in perfect accord with what was going on. I have received suggestions from him, and have tried in every instance to represent him, and not to represent myself; and we are certainly to be congratulated on having so distinguished a man to really preside over us.

Dr. Gihon.—Mr. President: As the last act of the Association, I desire to move that the thanks of this body be tendered to the retiring president, Dr. Eduardo Licéaga, for the distinguished manner in which he has represented himself at this meeting, and for the admirable way in which he has performed his duties.

Seconded and unanimously carried.

Dr. Licéaga then addressed the Association in Spanish. He thanked Dr. Woodhull for having so well represented him on account of his inability to speak the English language, and if it were not for him it would have been impossible for the work of the Association to have been despatched so quickly and so ably.

On motion of Dr. Valentine, the thanks of the Association were extended to Dr. Woodhull for the efficient manner in which he had conducted its business.

On motion, the Association then adjourned, to meet in the city of Philadelphia, in 1897.

TREASURER'S REPORT.

Henry D. Holton, Treasurer

In account with

The American Public Health Association.

RECEIPTS.

1895	Dr.	
Sept. 23, cash on hand	$574 08	
Cash from sale of transactions	118.40	
Cash from dues of members	2,075.00	
Cash from advertisements	118.00	
Total		$2,885.48

DISBURSEMENTS.

	Cr.	
1895		
Oct. 16, paid I. A. Watson, expenses as per bill, order No. 34	$424.82	
Oct. 21, paid J. George Adams, expenses in behalf of Com. Pollution Water, order No. 35	44.37	
Oct. 21, paid Charles Smart, expenses for Com. Pollution of Water, order 36	26.73	
Oct. 21, paid Henry D. Holton, expenses of secretary and treasurer, $134.55, and $122.10, Denver meeting, order No. 37	256.65	
Nov. 4, paid William Whitford, reporting Denver meeting, order No 38	130.60	
Nov. 4, paid Republican Press Association Oct. quarterly, etc., as per bill, order No. 39	450.34	
1896		
Apr. 3, paid American Express Company delivery of transactions, as per bill, order No. 40	13.19	
March 14, paid Mrs. F. M. Reeves for copies transactions as per bill, order No. 41	20.00	
Apr. 29, paid Albert Gihon for transactions as per bill, order No. 42	23.00	
Sept. 10, paid H. D. Holton, Treas., expenses as per bill, order No. 43	132.86	
Sept. 12[1] by cash on hand	1,362 92	
		$2,885.48

BUFFALO, N. Y., Sept. 17, 1896.

To the President and Members of the American Public Health Association:

GENTLEMEN: Your auditing committee to which was referred the report of the treasurer for the past year, begs to report that they have compared it with the books and vouchers, and finds it to be correct.

Respectfully submitted,

CROSBY GRAY,
J. F. KENNEDY,
J. W. COVENTRY,
Auditing Committee.

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[1] This includes balance of index fund unexpended of $493.48.

THE BICYCLE AS A SANITARY MEASURE.

By ALBERT L. GIHON, A. M., M. D.,
Medical Director, United States Navy (Retired).

When it was suggested that the time was opportune and the duty incumbent for the consideration by this Association, in its capacity as conservator of the public health, of the sanitary phase of the present popular means of progression, which has come in vogue among every class in every country, my esteemed friend for years, the distinguished secretary of this body, urged upon me that I must be conservative in my expressions, since so many of its members ride, adding significantly: "I am something of a bicyclist myself"; and Dr. Watson's warning not only quickened my sense of the opposition I might encounter in even merely questioning the excellence of that which everybody, save perhaps myself, was ready to defend as excellent; but I find myself estopped by another bar to entire freedom of criticism. It was only last year that I, a Washingtonian by residence, till then convinced that the federal capital was absolutely unrivalled in her municipal glories, saw, for the first time, this beautiful city of Buffalo, and forthwith succumbed to her irresistible charms, so that I was henceforth enslaved by two mistresses, and only knew how inexpressibly happy I could be with either, when "t'other dear charmer" were away. Now, the fact that both, alike in their unparalleled extent of smooth, broad, shaded avenues, have been hot-beds for hatching prolific broods of the popular pet I was proposing to vivisect, makes me hesitate to say what I should in the plain terms the subject deserves. Narrow-minded, prejudiced, uninformed, downright ignorant, are only some of the epithets, with which I may expect to be pelted, so that it behooves me to declare, at the very outset, that I have not set out to assail the ideal bicycle and the ideal rider, the theoretical health and pleasure seeker, who, by means of this wonderful apparatus, which is now in unlimited styles and qualities offered for sale, rent, loan, or gift wherever one turns, is to be made strong and virtuous and consequently, and correspondingly, happy. Living in a part of upper New York city, where the clean, broad, smooth avenues are almost as admirable and attractive for riders of the double-wheel as those of Washington and Buffalo, I see—and see all the better that I am not one of the moving multitude—morning, noon, afternoon, and night—and on to very late hours at night—what? A gliding throng, which, at first glance, an Oriental stranger might infer to be all men and boys, but on closer view is found to include both sexes and all ages, the much larger proportion of the unmistakable males, contorted and distorted into a hideous carricature of the shape of man—a creature doubled upon itself, crouching as if in fear, its face peering intently and anxiously, with contracted brows, compressed lips, pallid cheeks, and restless eyes—its neck bent, its back curved into a curious hump with chest and abdomen correspondingly hollowed, its thighs at an acute angle upon the trunk, its arms flattened and its legs working like the piston-rods of a steam-engine. Robert Grant poetically apostrophizes a specimen :

> " O youth, who bending forward, ride apace,
> With melancholy stamped upon your face,
> Pursuing pleasure with a frenzied eye,
> Yet mocked by her, however fast you fly,
> Are you aware how horrible you look ?
> No guy invented for a picture-book
> Was ever a more painful sight than thou,
> Lord of the bent back and anxious brow.
>
> " Oh, sit up straight, and try to wear a smile!
> Be less intent to pile up mile on mile.
> Enjoy the prospect as you ride along,
> The trees, the sunshine, and the robin's song.
> To us who view you scorching day by day,
> Bent on your bar in such an awkward way,
> You are the homeliest thing on earth, my lad.
> Oh, sit up straight and make the landscape glad."

As if to exaggerate the grotesque sight, at rare intervals, there slowly passes a manly figure, erect, with ruddy cheerful face and graceful pose, seated comfortably as upon a horse, with arms drooping, and leisurely treading upon the pedals as if walking, who, in all probability, is a medical man, the exemplar of what a bicyclist ought to be, is claimed to be, but in fact is *not.* With him I have little fault to find. I am only contending that the average man and boy, who ride to-day, the vast majority of all who do ride, are doing so at the sacrifice of health under the pretence that they are seeking health. The curious posture, in which the daily newspapers and the periodicals devoted to wheeling interests represent the expert riders, the heroes of the wheel, which is affected by wheelmen's clubs, and is consequently imitated by amateur boys and immature men, and which indeed the structure of the apparatus makes compulsory, is self-condemnatory, and requires no disproval in this Association. The weight of the body, which in the normal act of walking is wholly borne upon the femurs, is largely thrown upon the perineum, and though riders and writers and especially makers claim that it is supported by the feet and hands, I have been consulted too often by young men as to the best form of truss to wear, not to know that the region, which nature placed where it would be safe from injury, is subjected to the unavoidable stress of jolting and pressure in ascents. Even when the more serious contingency is provided against, the perineal space cannot escape being pressed, contused, and shaken, with the certain result of ultimate pro static congestion, hypertrophy, stricture of the inclosed canal, cystic irritation, and chronic inflammation. If the habitual, intemperate, and irrational riders, who constitute the greater class, are not frank enough to admit the increased desire and gradually growing difficulty in voiding the emunctory, and the sensations of fulness, soreness, and actual pain, I can only say, "The evil be upon your own heads," and prophesy, that if they continue to ride as they are doing, not many years will lapse, especially if they have already reached their climacteric, before they will be food for the genito-urinary specialist, who will reap golden (perhaps only silver) harvest from the seed they are sowing. Indeed, I can give no more significant hint to the young medical man choosing his field, than to make the perineum and its adjacencies the subjects of his especial study.

As a mere matter of personal hygiene, except for its remote effects upon the community, we might ignore the folly of the heedless bicyclist, and allow him to prematurely emasculate himself and suffer all the pains and penalties he pleases; but it is another matter when the welfare of that sex is concerned upon which depends the welfare of the race.

It is contended that the bicycle has wrought incalculable good for the gentle sex by taking them outdoors, where they pass hours in physical exercise, which they would otherwise devote to novel-reading, nocuous desuetude, and otherwise inactive in-door time-killing. Certainly, the amazing revelations for which bicycle costumes and their involuntary displays are responsible, of spindle-shanks, knock-knees, and less objectionable bow-legs, are evidences of a lamentable lack of development and the necessity for the physical betterment of the unfortunate possessors of such slender, unsubstantial understandings. It is true that very moderate daily pedestrian exercise would effectually develop the flaccid muscles of support and progression, as well as improve the physique and round the outlines of the whole body, but the statement is made that the women, especially the young women, of this country, will not, like their more robust British sisters, walk and be strong, and that, therefore, the bicycle is a commendable inducement to do in the name of pleasure what they will not do for the sake of health. Perhaps too I, in my fruitless battle against the abomination of corsets, ought to be grateful to the wheel for having indirectly accomplished the slackening of the tense cord that mercilessly binds, although with their Chinese sister martyrs they all protest it does not, by the enlargement of the waist alleged to follow its use, but is even this good gained without compensating cost?

The human body has been most wonderfully and wisely supported on a pair of legs, which receive its weight and transport it in the most effective way, the very act of transportation serving also as the most perfectly devised exercise of the entire bodily structure—the delicate apparatus on which the perpetuation of the race depends being protected in site and from every possible exposure in this normal act of walking. The hand is a wonder-piece of adaptiveness to intelligent purposes—but the human legs are scarcely less marvelously fitted for the needs of man in his relations with the exterior world. I have sufficiently indicated how the foolish rider—the rider whom wheelmen's leagues denounce and discredit by resolutions, but who nevertheless is daily pictured as the typical rider, the wheeling celebrity, violates the physical conditions of his structure. Is it different with women?

Certainly very few flatten themselves on their wheels and hump their backs. As a rule, they sit upright, but upon what? Listen to what an enthusiastic bicycling physician, a eulogist of the wheel, Dr. James F. Prendergast, of Philadelphia, read before the Section on Gynecology of the College of Physicians of Philadelphia, and published in the *American Journal of Obstetrics and Diseases of Women and Children* for August, 1896: "The ideal saddle has not yet been produced. Dealers and riding-teachers in general are very ignorant of the wants of women riders, and have no definite ideas as to their requirements or as to what a saddle should be like, and will recommend the most abominable saddles as ideals of comfort, simply to make a sale." (If this be so in Philadelphia, how must it be in Oshkosh?) "The ideal saddle should be broad enough to sit upon with the weight carried on the tuberosites of the ischii; it must not produce pressure on the perineum or have a high peak to injure the vulva; it should not chafe and produce saddle-soreness; it should be cool and springy enough to take up shock and vibration not so disposed of by the pneumatic tire": all of which, I cordially commend to your most careful consideration. If you will, as I do, critically scrutinize every saddle you can, you will find that even an approach to this broad sanitary seat here so well limned by an experienced medical wheelman is very, very seldom in evidence. Only a few days ago, I chanced to witness a father purchase a very expensive bicycle for his delicate sixteen-year-old daughter, which with all its exquisite finish, elaborate embellishments, and numerous appurtenances, had a saddle no wider than my hand, with a projecting anterior horn or pummel as hard as metal. The majority of women riders are now using, from ignorance, from indifference, for economy perhaps, the "abominable saddle," which it ought to be unnecessary for me to condemn to physicians, and I can only express my astonishment that any medical man can complacently see a young girl supported upon the edge of a wedge—on which rest, weighted down, the super-imposed soft structures, which nature sought to protect by a bony casing. The immature girl, in whom the normal act of walking tends to spread apart the bony border of her plastic pelvis, mounted as thousands are to-day, has a future of misery and suffering from the narrowing of its outlet by the approximation of the tuberosities through this criminally insinuated wedge.

When no other saddle than that which Dr. Prendergast has outlined, and which he himself declares "has not yet been produced," shall be in use, one chief objection to the wheel shall have been removed. When adolescent girls, especially, shall be restrained to a very moderate indulgence in wheel-riding, it may even be commended. This, however, is not the case to-day, when the mad devotees of the wheel bestride anything they can get, and sacrifice everything for the novel indulgence. Soreness, chafing, bruises, excoriations, abscesses, extreme fatigue, faintness, exhaustion, palpitation, vertigo, are unwillingly disclosed in confidence, because the saddle was uncomfortable, the road rough, the day hot, or the ride a little longer than she intended. Only a few days ago, I saw, in consultation, a vulvar-vaginal abscess developed in a young wife, who had been advised to ride an hour or two daily for the relief of a sub-acute pelvic complaint.

Dr. Robert L. Dickinson, of Brooklyn, a gynecologist who espouses the use of the bicycle, in a recent interview which I take to have been authorized, declares: "In praising the use of the bicycle, I must not lose sight of the fact that much depends upon right dressing, upon posture, and upon the saddle. Tension and excess may do much harm. All the possible benefits may be offset by disregard of these points—unquestionably, there are many women, who are not benefiting themselves. One has but to glance at the riders of the hampered sex to see nine bicyclists ignorant of some of the rules of good riding, who misapply force, waste effort, and run a certain risk of harm." An eminent medical officer of the army, himself a wheelman, writes me, "my personal experience convinces me that *leaning forward* when riding produces injurious pressure upon the perineum—and two other sources of danger might also be mentioned—the *rocking pelvis*, from too high a saddle, and the *walking-beam* movement from one too low."

Sanitarians are not directly concerned with the morals or æsthetics of the wheel. The promiscuous commingling with objectionable persons portrayed by the philanthropic lady who is president of the Woman's Rescue League is a matter of parental control. Already it is alleged that the fact that ladies of social pretention, as in London, are jostled on Hyde Park by the Mary Anns and Betsey Janes of below stairs; or in Paris are outshone on the Champs Elysées and Bois de Boulogne by the resplendent beauties in knickerbockers of the *demi-monde*, or in New York are abreast or in line with the more modest denizens of the Tenderloin or Central Park and the Boulevard, or in Washington are outnumbered and literally overshadowed on the Avenues by their dusky cooks and waitresses, will eventually cause the bicycle to be abandoned by those who can afford other vehicles or who have the sense to walk, while the hideous unattractiveness of the costume will decree its wane. The woman, who can endure a corset, in spite of its discomfort and meddling physicians, will not continue to ride merely because it is sanitary and salutary, if as a fair Parisiene, who had renounced the wheel declared, "one cannot display one's new gowns." When the stout matron, for whom no anatomical seat can be made wide enough, shall look critically upon other stout women and see, as in a looking-glass, her own amplitude, little will health, exercise, or even pleasure, induce her to risk the further revelation of too well delineated outlines, that the drooping walking-skirt decorously veils. When the attenuated maiden discerns that leather leggins and thick woolen stockings only make her asymmetry more conspicuous, she, too, will prefer the graceful concealing folds of the street gown. When all women realize that the spectacle of clumsily-clad legs, working up and down like piston-rods, is not attractive to others, and after a while monotonous and wearisome to themselves, they also will recognize that a well-poised figure becomingly attired, whether it moves on the city promenade or country road, with the English stride, the French toe-stepping gait, the Andalusian glide, or the American well-planted step, is something to be gazed upon with lingering longing.

Finally: as a matter of mere health incentive, pedestrianism remains unrivalled. For those, however, who will not walk, the bicycle, under the restrictions and limitations indicated, may become a useful alternative. Yet, I read in an illustrated magazine for this very month: "The best coasters" (who are so pictured,) "*stoop forward till the back is level*, keeping the elbows as close to the sides as may be," and another writer in the same journal, which is devoted to the popularizing of the machine, declares as "the ideal pose for the most efficient and comfortable riding—that the *body should be bent forward from the hips*," addressing his advice "as well to women as to men." "The former," he adds, for it must be *her*, "are apt to be disinclined" (to their infinite credit be it said) "to lean forward as they properly should, because they fancy the leaning position is ungraceful," of which there can be no question.

Repeating: If the bicycle is to merit praise, the ridiculous posture affected by professional male riders and their imitators must be discountenanced and denounced by wheelmen's periodicals, forbidden by wheelmen's clubs, and discouraged by reputable makers and dealers. Girls under the age of puberty should be restricted by parents, guardians, and teachers to short rides, and no woman of any age be mounted on any other than a wide, elastic seat without anterior horn or central ridge. Lastly, the gait of the bicyclist should be such as can be maintained with the least personal effort.

Nevertheless, I venture the prediction that a light three or four-wheeled vehicle, impelled by some easily-manageable motor, inexpensive enough to be generally available, will be the means of progression for pleasure purposes in the future—covering long distances without fatigue, permitting sight-seeing and out-door exposure without labor, and adding the charm of companionship and participated enjoyment; while the rational instrument of exercise for exercise's sake alone will ever be a pair of sturdy human legs.

DISCUSSION.

Dr. E. H. Carter, of Des Moines, Ia.—I once entertained the ideas that my worthy friend, Dr. Gihon, expressed to-night. I predicted a great deal of trouble from the use of the bicycle, and felt sure that it would come largely from the form of the saddle, and the position assumed by the rider. I predicted, some years ago, that female diseases would be common as a result of its too frequent use, and I have been in a position to know whether that has come to pass or not. I waited for it, and it did not come. A short time ago, a dealer in bicycles in my city came to me with a bundle of Chicago papers, containing articles from prominent physicians of Chicago, highly recommending the use of the bicycle. He asked me to look them over, and then write an article for publication as an advertisement with my signature attached. Some of these articles were beautifully written, and extolled the use of the bicycle very highly. After reading them, I could have written a pleasing advertisement, but the tenor of most of them was not in accordance with my views. I examined the saddles in use, and found them, in my judgment, defective. I said to myself that I could make better ones, and that if I invented a saddle I would not have a horn on it.

My son wanted a bicycle, and I objected, but finally told him that he could have one, if he would, when riding it, sit erect. He would agree to almost anything to obtain the bicycle, but having some knowledge of the use of it, he decided that he could not comply with the requirements. Still, he wanted the bicycle. He argued that it was not practical to remain the most of the time, when riding, in the erect position; that his friends who rode did not sit erect when "scorching," or when going up hill. About this time I spent a few weeks in California, and during my absence my wife learned to ride. When I returned, inevitable necessity compelled me to purchase a couple of bicycles. The bicycle being at hand, I soon learned to ride myself. Dr. Gihon speaks of the girls riding fast, and suggests walking for exercise, but you might as well tell a girl to go to a ball room, and not dance, but promenade for exercise, as to tell her to ride a bicycle and not ride fast; nor will she walk for exercise, after having learned to ride. Those who have not ridden bicycles do not know of the exhilarating and enlivening influence of such exercise. It is enchanting to sweep through the air with such ease and speed. Dr. Gihon speaks of the narrow saddle, and of sitting on the tuberosities of the ischii, and of the narrow saddle contracting the pelvis. How can it? It has a tendency to expand it. I would not expect any one to remain all of the time in an erect position when riding a bicycle. Often it is necessary to lean forward.

A comparatively small amount of the weight of the body is on the saddle. I saw a little miss the other day riding a bicycle, and she did not touch the saddle. She went floating in the air, and as she passed, a friend spoke to her. She turned her body, waved one hand, guiding with the other, while her weight was wholly on the pedals.

The wide saddle is impracticable, and the horn indispensable.

DR. ELIZA M. MOSHER, of the University of Michigan.—I know we all believe that moderation in all things is the law which should govern our lives, and as intemperance in bicycle riding is liable to occur, the note of warning which our worthy *confrère* has sounded this evening is not without value. Many of the points which he has touched upon are points which our riders should consider, and we should profit by the suggestions which he has so facetiously, and yet so earnestly, made. But I should be very sorry, as a member of this Association, to leave the matter at this point. I think some of his conclusions are not borne out by facts. Why is the bicycle of value? Even Dr. Gihon admits that it is valuable; even I claim that it is of special value to women, and my reasons for so believing, are these: On the bicycle a woman can exercise out of doors in a position which I believe is peculiarly conducive to an increase of bodily strength. When a woman sits erect on a bicycle, the pelvis, which is the pedestal of the trunk, rests in normal obliquity. The organs contained within it are in normal poise. With the pelvis in normal anterior obliquity, the lower ribs swing outward and upward, enlarging the lung space in the region where most space can be obtained. In this posture, every structure within the body, from the pelvic organs to the brain itself, occupies its best position for work.

The organs hang within their bony cases without interfering with each other, and, upon the wheel with its pneumatic tire, are carried over the ground with the least friction possible. In this position, the hips are balanced evenly, the shoulders are held parallel with them, thus no rotation of the spine is possible, and the head poises evenly and easily on the top of the spinal column. In riding, the muscles used are those which it is important to develop, *i. e.*, the muscles of the anterior part of the thigh, muscles of the calf, and those in the centre of the back, because these are the muscles which are used to hold the body correctly in the upright position, standing and walking. These, and other muscles are brought into use in the propelling of the bicycle, in a manner more forcible than in most other forms of physical exercise. So, practically, we have the woman in her normal posture; we have her out of doors; we have her rapidly carried away from the place of her work, and the place of her worries. She becomes exhilarated by the exercise, and her mind is taken off of those things which have a tendency to perplex and madden. As to saddles, there are some very good ones to be obtained now, and we hope for even better ones as time goes on.

One word more. You and I have for several years been watching bicycle riders, hundreds of them, and I appeal to you, Do these women riding upon the streets look unhappy? Do even half of them look unhappy and uncomfortable? On the contrary, it is an uncommonly happy, bright, and exhilarated set of faces which we see spinning down our streets.

Furthermore, I have been in the practice of medicine for twenty-one years, and during this time I have had what might be called a fairly large gynecological practice, and I have yet to see a single woman who has been seriously injured by the use of the bicycle. I say to you, in spite of all that has been said by Dr. Gihon about the harm produced by the bicycle, that I have had more than one patient recover under the influence of wise and careful riding, from maladies which I had been unable to relieve by other measures. I appeal to the members of this Association, and to the gentlemen and ladies present, to defend this worthy machine, and I beg that while defending it, you will at the same time bear in mind the cautions which have been presented this evening. They are wise and timely, only do not give to them *undue* weight because of their high source.

Dr. Gihon (closing).—I have not the slightest fault to find with the ideal bicyclist, but I claim that the ideal bicyclist is one that we seldom see. We do not see many of them. (Dr. Gihon then read a humorous piece of poetry written by a lady, which was entitled "A Bicycle View of Life.")

REPORT OF THE COMMITTEE ON THE CAUSE AND PREVENTION OF DIPHTHERIA.[1]

By Dr. J. J. KINYOUN, Chairman.

Your committee has the honor to submit, for your consideration, the following report:

It is intended in this report to give a short resumé of the status of diphtheria during the past year.

It is now almost a universally accepted fact that the *bacillus diphtheriæ* is the sole cause of the disease. Formerly, the *bacillus diphtheriæ* was supposed to cause only inflammation of the upper air-passages, which are accompanied by a pseudo-membrane. This belief is slowly changing, and the term diphtheria has a broader application; for it has been satisfactorily demonstrated that many of the inflammatory affections of the nose and throat not accompanied by a false membrane, were nevertheless caused by the diphtheria germ.

While this is not being accepted as rapidly by the medical profession and laity as the health officer could wish, the number of adherents to this belief is gradually increasing.

By reason of the microscopic and culture test, we have now two classes of diphtheritic infection to deal with, the one presenting the classical and typical symptoms—the clinical diphtheria—the other, where the symptoms are slight or absent, with the bacillus present, the so-called laboratory diphtheria.

Viewed from a public health standpoint this last form is, perhaps, more dangerous than the former.

The so-called membranous croup is yet, we regret to state, a most serious disturbing factor in our fight against diphtheria. It is with surprise and regret that we see how firmly entrenched in the minds of the medical profession is the idea that croup is a non-infectious disease. It has been domonstrated over and over again, so plainly that he who runs may read, that nearly nine tenths of these cases are laryngeal diphtheria. Yet despite all this, death certificates are constantly sent in to the board of health as "croup." These are the landmarks, or rather, tombstones, marking the foci of epidemics of diphtheria. It is noted with satisfaction, however, that many of our state, provincial, and municipal boards of health are beginning to be emancipated from such ideas, and now regard the terms "membranous croup" or "croup" and "diphtheria" as synonyms, and treat them accordingly.

The culture test and microscopic examination have been of great value in diminishing the number of reported cases of croup, and it is noted that they bear a direct ratio to the effectiveness of these examinations; that is to say, the more largely they are employed by the physicians, the fewer are the cases, not only of diphtheria, but of croup as well.

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[1] Read at the Buffalo Meeting.

The diagnosis of the disease in the United States is about evenly divided between clinical methods and the culture and microscopic examination.

In Canada, the health authorities of the Province of Ontario require the diagnoses of diphtheria and croup to depend upon microscopic examination. Clinical appearances in cases where a history of exposure to previous cases is present, are also of much importance.

In the Province of Quebec, microscopic examinations are made gratuitously by the board of health, but it is optional whether the physician avails himself of them or not.

In the United States, quite a number of the larger cities have the system of microscopic examination in operation. In one hundred and one cities having a population of 25,000 and over, thirty-six had established laboratories for this purpose, ten had only partial arrangements, usually with some member of the profession whose services were demanded in cases of doubtful diagnosis, and in fifty-five no system of any kind was in vogue. Several of these latter (in 1896) have established laboratories. The microscopic examination in the above mentioned is not compulsory. In those places where it has been in operation for over two years, the majority of the physicians patronize it in making the diagnosis, and nearly all do so in determining when the bacillus is absent from the throats of recovered cases.

In fact, it is believed to be the rule for the health authorities to require that secondary cultures be taken in all cases before they can be released from quarantine, or the infected materials and apartments can be disinfected.

It is noted especially that the death-rate from "croup" in the cities of the United States which have not adopted microscopic examinations, is very high in proportion to the number of deaths from diphtheria, and also in proportion to the population; while on the other hand, the number of cases of death from croup in those places in which the diagnosis is made by the culture test, has fallen, and the number of cases of diphtheria has increased somewhat.

Since the adoption of this method for diagnostic purposes, there has been an increase in the number of cases of diphtheria, due in part to the croup cases, already referred to, being properly diagnosed, and the additional cases of laboratory diphtheria. It has been asserted that on account of including these latter cases the death-rate from diphtheria has not been diminished, and the statements made to the contrary are misleading. It must not be lost sight of that the microscopic examinations have been the cause of eliminating a considerable number of cases formerly classed as diphtheria.

All bacteriologists agree that about thirty per cent. of the clinically diagnosed cases are not diphtheria; these are not now returned. In the same time the cases of laryngeal diphtheria have increased and membranous croup diminished. While the above obtains in the majority of places where the microscopic examinations are made, there are instances which may be cited to the contrary. In the Province of Ontario the cases of diphtheria, so far as positive evidence can be presented, have decreased where early diagnosis by the culture test has been made use of. In New York and Washington the death-rate has also been materially lowered.

The disease has prevailed generally throughout the United States and the Dominion of Canada during the past year. In a number of the states it has decreased or remained stationary, while in others it has assumed the proportions of an epidemic.

In 1,294 cities and towns, having in aggregate an estimated population of 23,209,937, reported 42,160 cases of diphtheria with 11,669 deaths, and 3,200 cases of croup with 2,989 deaths, a mortality rate of .46 per 100,000 for diphtheria, and .012 for croup. Statistics for comparison for 1894 are not obtainable. The percentage for diphtheria, 27 per cent.

The following will give an idea of the prevalence of diphtheria and croup in one hundred cities having in aggregate an estimated population of 13,857,562 and representing thirty-six states, during the past five years. In these cities there were fewer cases and deaths in 1895 than in 1894, as will be seen in the table beginning on page 60.

These reports show that the disease has prevailed to a greater extent in the cities of the East and Middle West, to a lesser degree in the Pacific states, and least in those of the South.

Explanations of this distribution will not be attempted further than to note the influence of climatic conditions, and less disturbance to the population by new accessions from other parts of the country.

It is to be regretted that the statistics from which these data are compiled are not more complete. Many states have a very imperfect system of their vital statistics, and while it is possible to obtain data from the majority concerning the death-rate from diphtheria and croup, it is difficult to obtain those dealing with their morbidity. This renders it extremely difficult to form a conclusion approaching accuracy.

Little, if any, information, therefore, has been obtainable concerning the prevalence of this disease in the rural districts. The information from one state and from the current medical literature shows that it has prevailed only to a limited extent, being almost entirely confined to the cities. Report from New York state shows the following:

There were 5,098 deaths from this cause, the largest of any of the zymotic diseases, except the diarrhoeal diseases.

Of these, 1,610 occurred in the winter months, 1,259 in the spring 966 in the summer, and 1,263 in the autumn. The largest number of deaths occurred in January. There has been a steady diminution in the mortality during the year until the usual fall increase, and this has been less than usual. There have not been so few deaths from diphtheria for several years as during 1895, the average for the three years preceding being 6,276.

As to its distribution, in relation to other diseases:

In each 1,000 deaths there were from diphtheria in the

	1895.
Maritime	52.12
Hudson Valley	29.00
Adirondack and Northern	18.80
Mohawk Valley	15.00
Southern Tier	25.25
East Central	15.80
West Central	12.25
Lake Ontario & Western	42.75
The entire state	42.00

As to distribution in relation to population, and density of population:

In each 100,000 population there were from diphtheria in the

District.	Percentage of city population.	Deaths from diphtheria, 1895.
Maritime	89.50	110.0
Hudson Valley	40.72	50.0
Adirondack and Northern	7.50	21.0
Mohawk Valley	30.93	22.0
Southern Tier	28.75	30.2
East Central	24.75	27.0
West Central	12.50	16.2
Lake Ontario and Western	64.50	65.0
Entire state	63.00	42.1

As showing the urban in contrast with the rural distribution of diphtheria in four large cities, having an aggregate population of 3,500,000, there were 3,800 deaths from this disease, giving a death-rate per 100,000 population of 108.5; in rural districts, having an aggregate population of 1,500,000 there were 400 deaths, giving a death-rate of 26.5.

In the smaller cities and large villages there were 900 deaths, which occurred in a population of 1,500,000 inhabitants, giving there a death-rate per 100,000 inhabitants of 60.00.

Manifestly diphtheria is a disease of closely aggregated communities, and its conditions of prevalence are much different from those of typhoid fever, ..."

NUMBER OF CASES OF DIPHTHERIA AND

STATES.	Population. 1890.	Population. 1895.	1891.	
			Cases.	Deaths.
Alabama	31,076	37,817	....	13
Arkansas	25,874	35,000	....	6
California	424,460	499,690	308	360
Colorado	106,713	145,000	468	175
Connecticut	212,040	219,341	505	183
Delaware	61,431	70,000	....	71
District of Columbia	230,063	275,000	582	202
Georgia	43,189	55,000	20	12
Illinois	1,140,874	1,666,000	2,973	1,015
Indiana	221,802	260,632	882	215
Iowa	166,556	158,519	327	110
Kansas	31,007	35,000	....	....
Kentucky	161,129	211,000	....	....
Louisiana	242,039	275,000	129	56
Maine	36,425	40,000	29	6
Maryland	434,439	496,315	822	350
Massachusetts	1,016,979	1,167,897	1,591	444
Michigan	340,315	373,000	1,853	503
Minnesota	297,894	438,082	658	205
Missouri	451,770	560,000	771	249
Nebraska	140,452	140,000	429	108
New Hampshire	44,126	55,000	21	2
New Jersey	620,363	724,871	1,334	653
New York	3,029,646	3,844,904	7,037	2,634
Ohio	820,960	1,050,760	3,114	734
Oregon	46,385	81,000	54	10
Pennsylvania	1,484,070	1,722,793	4,406	1,269
Rhode Island	159,779	178,049	218	53
South Carolina	54,955	36,295	4	3
Tennessee	169,763	183,679	107	44
Texas	132,381	110,000	....	13
Utah	44,843	70,000	218	110
Virginia	34,871	40,000	....	....
Washington	78,843	110,000	....	6
West Virginia	34,522	38,000	....	....
Wisconsin	204,468	250,000	1,489	400
	12,476,502	13,857,562	30,349	10,214

DEATHS THEREFROM, REPORTED.

1892.		1893.		1894.		1895.	
Cases.	Deaths.	Cases.	Deaths.	Cases.	Deaths.	Cases.	Deaths.
....	6	....	3	....	1	....	1
....	6	....	9	....	....	....	....
211	259	184	194	288	206	224	55
300	89	318	106	223	64	248	40
621	229	664	237	316	166	373	123
....	41	....	12	....	12	....	12
361	121	413	159	499	176	265	66
44	19	28	12	14	6	8	6
3,497	1,041	2,604	1,002	1,921	1,298	4,329	1,441
923	240	610	150	672	134	950	170
313	78	457	96	357	59	370	50
34	3	108	35	63	14	190	41
....	....	....	....	....	37	32	84
120	53	241	89	457	124	534	80
21	7	24	9	86	18	118	17
753	381	252	185	267	198	371	265
2,272	697	2,191	713	3,950	1,110	5,960	1,000
1,656	460	1,957	410	1,422	303	1,216	244
670	220	518	140	353	105	984	221
671	208	613	242	751	238	2,878	519
256	58	166	38	139	28	114	23
26	5	7	1	42	11	47	12
1,365	533	1,011	408	1,760	489	3,147	549
7,432	2,931	9,688	3,160	14,717	4,191	15,269	3,185
2,905	629	1,905	467	1,907	465	1,619	375
95	18	49	3	82	11	108	16
6,190	1,759	4,224	1,147	4,182	1,322	4,538	1,320
138	46	189	79	210	71	491	135
20	4	4	3	8	2	22	4
68	26	48	12	57	20	59	25
....	15	....	13	....	25	....	12
97	49	65	24	14	7	21	11
....	....	....	....	....	....	....	....
6	5	7	3	20	4	17	2
....	....	....	....	....	....	70	27
1,193	400	620	209	436	175	375	112
32,258	10,635	29,165	9,370	35,213	11,090	34,947	10,243

NUMBER OF CASES OF CROUP AND

STATES.	Population. 1890.	Population. 1895.	1891.	
			Cases.	Deaths.
Alabama	31,076	37,817	....	13
Arkansas	25,874	35,000	....	4
California	424,460	499,690	15	29
Colorado	106,713	145,000	....	....
Connecticut	212,040	219,341	67	53
Delaware	61,431	70,000	....	....
District of Columbia	230,063	275,000	....	7
Georgia	43,189	55,000	....	34
Illinois	1,140,874	1,666,000	....	11
Indiana	221,802	260,632	....	22
Iowa	166,556	158,519	22	22
Kansas	31,007	35,000	....	....
Kentucky	161,129	211,000	....	....
Louisiana	242,039	275,000	490	609
Maine.	36,425	40,000	....	2
Maryland	434,439	496,315	7	....
Massachusetts	1,016,979	1,167,897	548	503
Michigan	340,315	373,000	18	17
Minnesota	297,894	438,082	....	49
Missouri	451,770	560,000	150	91
Nebraska	140,452	140,000	....	....
New Hampshire	44,126	55,000	....	....
New Jersey	620,363	724,871	....	10
New York	3,029,646	3,844,904	213	327
Ohio	820,960	1,050,760	13	18
Oregon	46,385	81,000	....	16
Pennsylvania	1,484,070	1,722,793	....	96
Rhode Island	159,779	178,049	....	....
South Carolina	54,955	36,295	....	13
Tennessee	169,763	183,679	63	503
Texas	132,381	110,000	9	182
Utah	44,843	70,000	....	1
Virginia	34,871	40,000	....	....
Washington	78,843	110,000	....	1
West Virginia	34,522	38,000	....	....
Wisconsin	204,468	250,000	....	8
	12,476,502	13,857,562	1,615	2,641

DEATHS THEREFROM, REPORTED.

1892.		1893.		1894.		1895.	
Cases.	Deaths.	Cases.	Deaths.	Cases.	Deaths.	Cases.	Deaths.
....	15	....	16	....	17	....	14
1	9	....	3	3	2	1	3
17	14	1	20	2	29	0	18
....	....	....	....	....	....	....	....
115	123	66	64	75	64	114	58
....	....	....	....	....	....	....	....
....	7	....	13	....	13	....	8
....	42	....	38	....	39	....	38
....	11	322	255	449	350	523	352
....	....	34	22	34	25	36	33
14	141	11	135	16	92	23	81
....	....	....	....	1	1	10	7
....	....	7	14	5	23	....	....
530	670	552	538	486	511	428	342
5	3	8	6	5	2	9	7
....	11	....	18	....	5	....	....
480	427	350	305	494	411	342	371
8	7	21	28	18	27	22	29
....	12	....	11	....	2	....	3
159	103	216	133	263	130	355	156
....	....	....	....	....	....	....	....
....	....	....	....	....	....	....	....
25	25	21	22	13	6	17	5
246	272	142	175	110	113	267	152
15	14	29	35	38	30	53	31
....	34	....	28	....	6	....	25
....	110	....	79	....	57	....	94
....	....	....	....	....	....	....	....
....	3	....	5	....	8	....	11
107	698	72	611	102	170	110	277
18	142	22	103	9	60	24	64
....	....	....	1	....	2	....	4
....	....	....	....	....	....	....	....
....	19	11	6	12	5	4	4
....	....	....	....	....	....	....	....
22	24	20	14	19	23	44	18
1,762	2,936	1,905	2,697	2,154	2,223	2,382	2,205

The vital statistics for Ontario, for the year 1895, have not been tabulated. The secretary of the board of health of the Province states "that diphtheria has been much more restricted both in its general prevalence and mortality in Ontario, in 1895, than in most previous years. The death-rate per 1,000 for the whole province, for 1894, was forty-nine; this figure is probably slightly below the figure."

There has been a decided increase of diphtheria in the Province of Quebec for 1895, over the previous year. In Montreal, the death-rate was about five and a half times greater than in 1894. In the city of Quebec and other larger towns the disease has not been especially prevalent.

The majority of cases of diphtheria are disseminated without doubt by direct contagion from child to child in the household and in the schools or other places where children are wont to congregate; indirectly, by infected apartments or articles contaminated with the germ.

Unsanitary house conditions, such as vitiated air, dampness, etc., undoubtedly affect both the number of cases and their virulence. Climatic changes may, and often do, determine an outbreak; the infection may be semi-latent, only awaiting an opportunity to manifest itself.

How far the ordinary sore throat of the adult influences the spread of the disease, is an unsettled question. A certain proportion of these are caused by the Klebs-Loeffler bacillus. From observations made in a certain place on this affection, in a hospital dispensary service, and at a time when diphtheria was not so prevalent, twenty-five per cent. of the cases of sore throat were found to be diphtheria.

It is evident that such cases are just as dangerous as those cases of laboratory diphtheria in spreading the disease.

Kober has collected statistics of twenty-eight epidemics of diphtheria which were traced to milk infection, the original source of infection coming from those persons ill with the disease handling the milk.

It is believed that the railway and steamboat passenger traffic plays no small part in the dissemination of the disease, and should demand careful attention from all health officers.

Unquestionably, the early diagnosis in suspected cases is most important of preventive measures. A prompt detection cannot be made of all cases by a clinical diagnosis—it matters not how skilful the diagnostician. To be absolutely certain, the culture test must be applied.

This is of equal importance in determining when the case has fully recovered and is no longer a menace to others.

We are of the belief that if the above diagnostic methods were generally applied and uniformly executed, the ravages of this disease would be quickly stayed, and the disease itself become one of the least disturbing factors to the public health.

Early notification of all cases of diphtheritic infection should be insisted upon. Prompt isolation of those sick—either domiciliary or hospital—

private funerals, the non-transportation of corpses by train, should be enforced by law and practice. Isolation should also be made to include those who have been directly exposed to infection for a time sufficient to demonstrate their freedom from the infective agent.

Those having the bacillus in their throats should be treated as cases of diphtheria.

Great care should be exercised in the schools; they should be under the direct supervision and control of the health authorities, so far as their hygiene and sanitation is concerned. A daily medical inspection should be made of all the schools in the larger cities. This may not be practicable or necessary in small towns and rural districts; but when a case has been detected, the inspection should then be maintained for several days.

We shall now consider the prophylaxis and treatment.

Our laws and ordinances against infectious disease have for their object the prevention and suppression. We prevent infection because the infected die; if the contrary were true, that the diseases were not so fatal, we would not be so concerned about them. If the ultimate object of these restrictive measures is to prevent death, it behooves us to use every means in our power to combat the disease. It matters not in what way we direct our efforts, provided they are successful in suppressing or modifying the course of the disease. We have advocated the culture method for diagnosis for all cases of diphtheria. If this position is a correct one, and necessary, then we should advocate other measures of equal efficiency.

Two years have now elapsed since the introduction of the new remedy for the treatment and prevention of diphtheria. It is believed that there has been sufficient evidence submitted to form an unbiased opinion of its true value.

The consensus of opinion in all countries has been very favorable to its use. Its adherents now number thousands, while the opponents can be numbered as few.

The reports from the Dominion of Canada state that there has been a gradual diminution of death-rate from diphtheria, and the ratio of disease has been proportional to the use of the remedy. One report from Mexico states that it has reduced the mortality of one city forty per cent. over previous years.

In the United States the same is true. In those places where there has been the largest quantity of antitoxin used, there has been a decrease in the number of deaths over 1894, although there has been an increase in the number of reported cases.

The published reports of one hundred physicians and twenty health boards show, for the year 1895, and the first three months of 1896, that there were 7,021 cases of diphtheria treated by antitoxin with seven hundred and forty-one deaths—a death-rate of ten and six-tenths per cent., as compared with 2,936 cases of diphtheria occurring synchronously with 1,110 deaths—a death-rate of thirty-nine per cent.

The largest number of cases treated was in the cities of the East and Middle West. Of the reports of the physicians and health boards, fifty-three physicians and nine health boards were in the East, forty physicians and nine health boards in the Middle West and Northwest, two physicians and one health board in the West, and five physicians and one health board in the South. The above table in part bears out the statement that where the largest number of reports come from there have been more cases recognized as diphtheria and less as croup; while on the other hand, where the fewest reports are made the cases of croup preponderate.

Antitoxin, while believed to be a remedy par excellence, is believed to have increased the number of cases in many instances; especially is this so in the smaller places and the rural districts. The reason assigned for this is that formerly, when a child had diphtheria, it usually died, and parents kept their children away from the infected premises; now, as a rule, the rapid recovery of a child causes doubt as to the correctness of the diagnosis, and it is allowed to resume its associations with the bacilli in the throat, thereby disseminating the disease.

In the above statistics no attempt has been made to separate the cases into classes, or to exclude cases moribund when the treatment was given. They represent, it is thought, the average cases in age, duration, and severity. Care has been taken, however, to exclude from these, cases of laboratory diphtheria which are included in those who were given protective treatment.

These same reports show, that during this time—1895 and 1896—2,867 cases which were exposed to infection, in many of which the bacilli were found, were given protective doses, with the result of forty mild cases, occurring from twelve hours to thirty days after the infection.

In closing this report, your committee would recommend the following:

I. That there should be uniform rules and regulations adopted by all the states and provinces for the prevention and control of diphtheria.

The several governments should assume the responsibility and act in unison in preventing the spread of the disease from one country to another, and assume authority over interprovincial and interstate communication.

II. That it should be the duty of the health authorities to provide facilities for determining the diagnosis in all suspected cases by the establishment of inexpensive laboratories for each health jurisdiction.

To agree upon a system and means of transmission of material for diagnosis through the mails.

III. Compulsory notification of all suspected cases and the abolition of the terms croup or membranous croup, unless diphtheria has been excluded by culture and microscopic examination.

IV. Compulsory isolation of all cases, domiciliary or in hospital, until the recovered cases show the absence of the diphtheria bacillus.

V. That the medical inspection of schools should be inaugurated under the direction and supervision of the health authorities by making daily inspections in the larger cities of all school children, for the detection of infectious disease.

In the smaller places and rural districts, the inspections, while necessary, need not be made daily, but at least once per week, and daily for several days after the appearance of a case of diphtheria.

The plan advocated by Dr. S. Durgin, of Boston, at the last meeting of this Association, is highly commended.

VI. School buildings, books, etc., should be subjected to a reliable method of disinfection at least once per month, and oftener if suspected of being infected.

VII. The early treatment of those ill with diphtheria with antitoxin, the administration of preventive doses to those who have been exposed to infection and have the bacilli in their throats.

VIII. Prompt and effective methods of disinfection of infected articles and apartments to be carried out under the supervision of the health authorities.

BACTERIOLOGICAL DIAGNOSIS AS GOVERNING THE ADMISSION AND DISCHARGE OF PATIENTS IN DIPHTHERIA HOSPITALS.[1]

By PROF. E. B. SHUTTLEWORTH,

Trinity Medical College, Toronto.

The Isolation Hospital at Toronto was established in 1891, under the control of the local Board of Health. Up to June 30, last, there were admitted 1,690 patients said to be suffering from diphtheria, as so pronounced by their attendant physicians. Diagnosis by bacteriological methods was commenced in February, 1895, and since July of that year the discharge of patients has also been governed by this means of investigation.

The statistics for this period cover 565 cases, and, when compared with those for the preceding time, afford an opportunity for ascertaining the practical value of bacteriology when applied to the purposes indicated.

It is now generally conceded that, during the early stages of those throat affections in which a membrane is formed, it is difficult, and sometimes impossible, for those most skilled and experienced in such matters to make, by ordinary clinical signs, a certain diagnosis. Confirmation of this was afforded by the records of the first two months, which show that in 27.9 per cent. of the cases admitted the specific bacillus was absent. After five months, the percentage fell to 24.5, and it has since declined so that the average for the succeeding year is 12.4 per cent.

This decrease is in some degree due to the fact that bacteriological examinations are now frequently made, at the request of city physicians, prior to patients being sent to hospital, but is probably more largely attributable to the influence of the new system, which leads to greater care in the selection of cases. I think it may be safely said that the limitation of the number of patients from this cause amounts to about one eighth, thus showing a corresponding saving to the institution.

Other advantages, which cannot be estimated by dollars and cents, follow the admission of the patient. If it is shown that his case is of a non-bacillary character, he can be kept in an isolated ward, and thus avoid infection by the specific micro-organism—a result which would otherwise be very liable to follow. The treatment of the case is also beneficially affected by the correct knowledge at the disposal of the medical superintendent. If the diagnosis has been speedily made, the disinfection of the patient's former residence may be obviated, and the assurance that there is no danger of infection must be a great relief to the patient's friends.

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[1] Read at the Buffalo meeting.

It is, however, in fixing the time of discharge that bacteriological diagnosis has proved of the greatest value. It was formerly the rule, that all diphtheria cases should remain in hospital for fourteen days after the membrane had disappeared, or the more serious symptoms subsided, and, in the opinion of the medical superintendent, there was no danger of infection being carried out of the institution. The statistics of 1893 and 1894 show the following as the average duration of the hospital term:

1893.	236 non-fatal cases	26.3 days.
1894.	165 " "	25.9 "
	Average for two years	26.1 "

During the latter half of 1895, and the first half of 1896, in which discharge was governed by bacteriological methods, the average term was as follows:

1895–'96.	322 non-fatal cases	22.8 days.

This shows a shortening of the term by 3.3 days, amounting to a total of 1,062 days for the year, and has, of course, its economic application to both hospital and patient.

This result, though direct and decisive, does not fully represent the gain. The misleading peculiarity of averages must be here taken into account, in order that the case may be properly understood; 11.4 per cent. of the patients were only detained in hospital for periods ranging from 1 to 7 days, and 8.3 per cent. from 7 to 14 days. It will thus be seen that 19.7 per cent. of the whole number were discharged within the period previously fixed for convalescence only. Of those discharged within 7 days, the greater proportion was composed of non-bacillary, or false diphtheria, which usually ran the more serious part of its course in that time. In some few cases the patients were sent to tbe General Hospital, but, in any event, they were not considered proper subjects for treatment in an isolation institution.

Quite a number were detained beyond the usual four weeks. Thus, 13.9 per cent. remained for between four and five weeks; 5.9 per cent. between five and six weeks; 2.1 per cent. between six and seven weeks, while one out of the 322 retained infection until the 65th day, and another until the 75th day. These prolonged cases set off those which were speedily discharged, but still did not bring the average up to the detention under the old system.

These tedious cases in which the patient is apparently quite well, but whose throat is still the hiding-place of infection, constitute one of the most common means by which diphtheria is communicated, and the supply of patients continued. In one of the most extreme of these cases it was proved that the bacilli were virulent enough to cause in forty-three hours the death of a guinea-pig, and it may be presumed that, with human beings, the infection would have been sufficient to have produced disease.

It is in the detention of these cases that bacteriological diagnosis finds its chief use. The value of the bar thus provided against the dissemination of disease cannot be represented by any money value, though, even from this low standpoint, it is sufficiently apparent.

In regard to the reliability of this mode of conducting hospital discharge, I may say that, while it may not be infallible, it has proved reasonably satisfactory, and with greater experience and care, may be wholly so. On two occasions, and only two, out of the 322 under observation, was there any evidence of a recurrence of the disease in the patient, or any of those with whom he was known to come in contact. One of these was an instance of recrudescence which led to the return of a girl to the hospital; in the other, there was the apparent communication of the disease to a fresh patient. It cannot be positively stated that infection came from the hospital, but it seems probable that it so originated. Granting this, the failure amounts to only 0.62 per cent., which is a fairly low limit, with a prospect of further reduction.

DIPHTHERIA IN CHIHUAHUA.[1]

By Dr. M. MARQUEZ.

Diphtheria is one of the infecto-contagious diseases which are most observed in Chihuahua, and in such a degree that it causes real panic among families.

Formerly it was unknown here, it being well demonstrated that it was imported from El Paso, Texas, to Paso del Norte, now Ciudad Juárez, where it is said to be endemic.

Since 1881, when I commenced to practise in this city, I have observed that the different cases of diphtheria can be reduced to two well-defined clinical forms, one important, which does not announce itself by symptoms that call the attention of the families. The doctor, when called, finds upon examination of the patient, that the pharynx has been attacked by membrane, which in a few hours extends to the larynx; and then appears the peculiar cough, to so express it, pathognomonic of the laryngotomic croupal, accompanied by accesses of suffocation, which soon causes asphyxia, and death in a very short time.

If in this form we investigate the beginning of the affection, we are told there is no reaction, nor sore throat, nor difficulty in swallowing; that the appetite continues good, and little patients are bright, contented, and given up to their habitual plays, without any indication to the parents that they are captives of such a terrible disease, and that possibly they were prejudiced in noticing the accesses of suffocation, and the barking cough. It was so frequent to observe cases of this nature, that many children presented in our consultories, apparently attacked by a slight affection, have been able to run and play, but upon examination, diphtheria was recognized, and parents have been advised of the serious condition of the child; some of them became justly alarmed, and others doubted the prognostic, in view of the apparent state of salubrity, but finally all saw it confirmed; nearly all of these patients died within three or four hours after returning to their homes, under the affliction of asphyxia.

The other form is mild, but presents in its beginning an apparent seriousness, which disappears when treated energetically. The symptoms are as follows: Marked revulsion, temperature 39 to 40°, preceded by chills, pain in the pharynx, difficulty in swallowing, anorexia, rubicundis, followed by intense injection of the mucous membrane of the pharynx, where appear, two or three days afterwards, spots covered with false membranes, which, if not treated with energy, invade the pharynx, and may convert themselves into a serious form.

This form is likely to appear in families where some case of the serious kind formerly existed, and for this reason all its members are subject to the authorized inspection; the incipient cases are studied and treated or checked, with good results.

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[1] Read at the Buffalo meeting.

Which is the treatment employed with best results?

To what are we indebted that this affection disappears?

I can testify that my associates residing in Chihuahua display great activity, and they apply or devote themselves with great diligence and enthusiasm to the study of the best treatment; I also can affirm that there is no prescription known in science that has not been so thoroughly discussed and treated upon by different publications on both sides of the Atlantic, and also tested by practice with results so similar, that no preference can be given.

The last, the anti-diphtheritic serum, results in what our associate, Dr. Samaniego, expresses: But it is well known that by the medical treatment by the sueroterapia, the most that has been obtained is to diminish the mortality 40 per cent. The prophylactic measures and the hygienic prescriptions lend such valuable aid in the diminishment of the cases of diphtheria which claim so many victims, that I take the liberty of laying before you the following, so that, if it merits the approbation of the Association, over which you so worthily preside, you may favor it by giving your help and recommendation to all the boards of health, and delegates to the same, that they may put it in practice:

The diphtheria, or croup, is a disease eminently infecto-contagious, which attacks at any age, especially in youth, and its spreading may be avoided by the observation of the following rules:

1. Every patient with diphtheria or croup should be isolated in a separate room, and not be allowed to communicate with the other members of the family.

2. When isolation is not possible in the house, the patient should be taken to the hospital, lazaretto, or place designated for this kind of patients.

3. In the room of the patient there should be the necessary furniture for his use, which can be easily disinfected or destroyed by fire.

4. One or two persons are sufficient to attend the patient, and when leaving the sick chamber they should pass into another room, where they should change their clothes, and disinfect themselves.

5. The children of a family where there is a croup patient should be removed to another house, and should be daily watched and examined by the doctor, and should not be sent to school from twelve to twenty days after their isolation.

6. A family that may have a person sick with diphtheria should not receive any visitors, and by no means allow their entrance to the sick chamber.

7. Mothers with family, and other persons who have charge of children, should not visit houses where there is a croup patient.

8. It should be procured in order to have at hand, any of the following disinfectants: Carbolic acid, 5 in 1,000; sulphate of copper, 2 in 1,000; bi-chloride of mercury, 1 in 1,000.

9. The substances vomited by the patient, such as the false membranes (vulgar, slimes) emitted by accesses of cough, excrements, and all soiled articles, such as swabs, should be received in vessels containing one of the above-mentioned disinfectants.

10. In the room of a croup patient, there should be no eating, drinking, or smoking allowed.

11. Care should be taken that the false membranes and other discharges of the patient do not soil the floor, walls, or furniture.

12. The room of the patient must be well ventilated at a temperature of 18° to 20° centigrade, and the atmosphere saturated with moisture, which is obtained by boiling water in an open vessel.

13. The persons who may touch the false membranes or other objects which have been in contact with the patient, should wash and disinfect their hands immediately.

14. The articles of clothing, such as sheets, blankets, shirts, etc., which have been used by the patients, should be deposited in receptacles, which should contain disinfectants in sufficient quantity to perfect saturation of the articles.

15. The corpse of a croup patient should be placed in a box, well wrapped in a sheet which has been dampened in a 5 per cent. carbolic acid solution, and placed between two layers of lime and charcoal.

16. The burial will take place four or five hours after death. Wakes, funeral rites, with the body present, or attendance at funeral, should not be allowed.

17. Articles of clothing which may have served a croup patient, should be washed with soap and boiling water, and placed in the sun for two or three days, after having been from twelve to twenty-four hours in a disinfectant solution, and should be boiled in water for two or three hours.

18. The furniture, doors, and other objects of wood or iron, should be disinfected by rubbing them with a sponge wet with a 5 per cent. solution of carbolic acid and left in the interior of the room while disinfecting.

19. The room should be disinfected by burning sulphur, beginning by measuring the length, width, and height, in order to obtain the total capacity of the room, which will serve to give the exact quantity of sulphur that should be burned, taking as a basis 20 grams per cubic metre. Thus, for instance, for a room of 25 cubic metres, 500 grams of sulphur will be required.

20. As soon as the amount of sulphur to be burned is determined, the windows and doors should be hermetically sealed, with the exception of one, which will be left until the last, covering all the openings, cracks, etc., with paper, put on with paste.

21. In the centre of the room, two adobes or bricks alongside of each

other, separated twenty centimetres will be placed, upon which should be placed a sheet of iron or tin, perforated with very small holes. Upon this sheet of tin the sulphur should be placed and lighted with a match, after moistening with alcohol; the doors should be closed, and all the cracks and openings should be covered as indicated.

22. The room should remain closed twenty-four hours, after which it should be opened; the furniture and other articles previously disinfected should be removed, and after ten to fifteen days' airing everything can be used without danger of contagion.

23. Nurses and attendants may be disinfected by a bath in hot water, washing the skin well, especially the head and face, with carbolic soap of bichloride of mercury or borax.

24. Hands should be disinfected as follows:

I. Wash them with hot water, green soap, and brush.

II. Clean the finger nails.

III. Another wash, as the first, with cold water.

IV. Wash with a solution of bicarbonate of soda heated to 50° centigrade, changing the same frequently during two minutes.

V. Wash with distilled water, in a solution of salt of copper.

VI. Lastly, wash them in a solution of 1,000 of bichloride of mercury.

25. When the disinfection of the clothes, furniture, etc., is not possible, they should be burned.

DISCUSSION ON THE PAPERS OF DRS. KINYOUN, MARQUEZ, AND SHUTTLEWORTH.

First Vice-President—In some communities, there are opponents to the treatment of diphtheria with antitoxin, and this is an excellent opportunity for instruction, and if any one is disposed to give his reason why antitoxin should not be used, now is the time for him to do so.

Dr. M. A. Lyons.—I presume from what the vice-president has said, it calls for the results of some conversations that I had with him (Dr. Woodhull) yesterday, in reference to an epidemic of diphtheria that has been prevailing in the locality where I reside and in which I am health officer. For several months past, there has been a succession of cases, aggregating about sixty. At times, the disease would disappear and then return. Of those sixty cases, about forty-five were in one part of the town, and of this forty-five thus localized, there were some of the severest cases I have ever met. Ten of them, which originated there, died. Of those ten, antitoxin was used in four or five cases, according to my recollection. I cannot give the figures accurately. Four of them terminated fatally, and the antitoxin was no longer used. The methods employed were those that have been mentioned here, with the same conditions which proved to be important. The cases were looked up, brought to light as fast as possible, quarantined, and all precautions taken. There being no facilities for bacteriological examinations to be made promptly, people were instructed that every case of sore throat should be brought under treatment, and every case should be excluded from the schools, factories, public gatherings, Sunday schools, and churches, no matter what the character of the sore throat. The treatment consisted in the use of disinfectants for the throat, one of the most efficient being chlorine water, as recommended in the dispensatories, employed in small quantities, either as a spray or with teaspoon, every hour, night and day. Peroxide of hydrogen was used in the same way by some physicians, and those cases treated continuously in that way, got well, and did not convey the disease to any one else in the house. The localization of the disease in a particular part of the town was so distinct that some search was made for the conditions causing it. It was found in one particular locality where the fatal cases occurred, that there was a drain intended to carry off spring water. In the course of time, it had been used for purposes of common sewage. It was not intended for sewerage. It was a flat-bottom drain. It had been loaded up with sewage material without ventilation. Typhoid fever had been endemic in that part of the town for fifteen years, and resulted in something like two hundred cases of typhoid fever, and diphtheria started.

A hose was taken from the engine-house, connections made, and everything thoroughly flushed with water from the hydrants, and several hundred pounds of disinfectant were put into the hoppers and sinks and allowed to run through. This process was repeated, the drain broken into, and large jars were filled with material to generate chlorine gas to disinfect the sides of the entire drain, after which, the disease became sporadic. For a considerable time no cases have been reported, except in a farmhouse in that community where there has been a return of the disease at intervals of two or three days. They were well-marked cases of diphtheria, and quite severe. The membrane was abundant, and all of the other symptoms of the disease were well defined. I have not sought for any local condition in this particular instance, but I judge from a larger experience that the city sewage, or foul gases which issued from the drains along the street, had something to do with the outbreak. In one family, a girl was taken with the disease, recovered, but in the course of a month or two, another member of the family was stricken. In this particular house, the plumbing was of first-class character, extending down into the ditch, which, however, never flushed, and filled with these gases that could not be overcome by flushing. During the process of flushing, I went to the house for the purpose of putting some solution in the bath-room, and when the trap was pulled, the gases would go into the house. So it seems to me the endemic character of the disease is one that should be considered in reference to the measures to be taken in regard to it. While we should disinfect the throat in cases of diphtheria, the local conditions which originate the disease should be sought for.

Dr. J. N. Hurty.—I have the honor to be the state health officer in

Indiana. Very recently I had two interesting and important experiences, and as they present a feature not yet touched upon in this discussion, I feel impelled to present them.

On Friday I called with a doctor in a certain town to see a case of diphtheria. It was a typical attack of the disease, and the child eventually died. My companion smiled when, before entering the sick room, I produced a clean, glossy linen duster and skullcap from a glazed handbag, and, donning the garments, announced myself as ready to see the patient. It was plain that my precautions against infecting my clothes, and so carrying disease, were interpreted as fear, for the physician walked straight to the bed and took the child in his arms. A few drops of saliva fell upon his coat sleeve, but he was not afraid, and wiped them off with his handkerchief, returning the cloth to his pocket. Domiciliary quarantine, disinfection, early and private funerals, will not greatly succeed in stamping out diphtheria, if only a few doctors are permitted to sow its seeds. People who are held in quarantine frequently ask, "How do doctors keep from carrying disease?" "Why must I remain penned up, when the doctor comes and goes without taking precautions?"

My second experience was worse than the first. In this instance, I entered a house far in the country, and found there a death-bed scene. A child, about seven years old, dying with diphtheria, was rolling and tossing upon a dirty bed in efforts to get its breath. Around the bed stood the father, mother, three half-grown children, and the attending physician. The latter was in his shirt-sleeves. For this he apologized, saying the child had the day before vomited upon his coat and he thought best to remove it. "Did you make calls yesterday after leaving here?" I asked. "Yes, one," he hesitatingly replied.

Such occurrences as these will soon be stopped in Indiana, for our board has passed a rule requiring all physicians, under penalty for disobedience, to protect themselves when knowingly visiting diphtheria, scarlet fever, etc.

Said rule, with a foot-note, reads as follows:

RULE I. When visiting patients known to be sick with small-pox, scarlet fever, diphtheria, or other contagious or infectious diseases, physicians shall clothe themselves in a specially provided clean linen duster, oilcloth, or rubber coat, and a tight-fitting cap made of silk, linen, oil-cloth, or rubber. The cap shall well cover the hair. Before leaving the house, physician shall cleanse hands and face with antiseptic soap and water, and use a disinfectant upon hands and face. The coat, cap, antiseptic soap, bottle of disinfectant, etc., shall be carried in a special glazed leather valise, together with a pad of cotton, which is to be kept wet with formaldehyde.[1]

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[1] The disinfectant recommended is a 1 to 5,000 solution of corrosive sublimate, a 5 per cent. solution of carbolic acid, or a 1 per cent. solution of lysol. A cake of sublimated or carbolic soap may be conveniently carried in a traveler's soap box. The cotton pad

Dr. Carter.—I should like the doctor to tell us what he does with his coat. Do you carry it with you?

Dr. Hurty.—Immediately after the coat is taken off, it is rolled up and replaced in the valise, which, being filled with the vapor of formaldehyde, insures complete disinfection. The coat is, of course, frequently boiled and washed.

Dr. Katherine Miller.—Just a word with reference to the use of cups or other vessels for patients to spit in. It has been suggested that children or persons affected with disease should be required to spit in a vessel containing a disinfectant fluid. It is a matter of some difficulty to get a child to spit very accurately. I find the use of a common newspaper for children to spit on, a very excellent thing, and for older persons it is a great convenience. When the newspaper is soiled, as it is several times a day, it may be taken up, folded, put into the stove, and the contagion is absolutely destroyed. I think it is superior to any method of spittoons or bowls of disinfectants to spit in that can be used.

Dr. Henry R. Hopkins.—A practical observation as to the question of immunizing those exposed to the infection of diphtheria. It has been the experience for a number of years in the Buffalo General Hospital that in cases of diphtheria, particularly those upon whom tracheotomy or intubation has been performed, requiring very close nursing, that two out of five of such cases in our contagious pavilion infected the nurse. Year after year this has been our experience. Dr. Park, one of the surgeons of the city, in performing the operation of intubation, contracted diphtheria. The attack was very severe, and life was saved after great anxiety for a number of days. These observations, not many, but important, seem to warrant me in recommending that every nurse about to be exposed for days to the danger of diphtheria infection, should have placed at her disposal the opportunity of immunization. The medical attendant should offer to immunize the nurse. It occurs to me that every medical man, certainly every one who is overworked, who is a little below par in point of endurance, takes an unnecessary risk upon himself when he performs either tracheotomy or intubation without first protecting himself by an immunizing dose of serum.

I want to accept in part the challenge of the chair to say something upon the contrary side of the use of serum. The treatment of diphtheria by its antitoxin is familiar to you, and perhaps it means to all of us the same

is kept in the case or bag to absorb the formaldehyde. This chemical is our greatest antiseptic, and its vapor will destroy all germs.

It will be well to add to the above outfit, a roll of paper napkins and a bundle of small, flat, pine sticks to be used as tongue depressors. The paper napkins are suggested because towels can not sometimes be found at the houses of the poor, and if they were found, might be infected. Having one's own napkins gives perfect independence. The wooden tongue depressors may be whittled out of pine, or better, obtain from seed dealers the flat pine markers for flower beds, which gardeners use. They cost seventy cents per thousand.

thing. I hope that it means to all of us simply an adjunct to the other well-known remedies which time has made of great importance to the medical profession. Against such use of antitoxin I have not a word to say, but there is even in sanitarians, as in the world at large, occasionally a tendency to ride a fad, and we see in journals the information that we may depend upon the use of antitoxin serum for the treatment of diphtheria. Against that I would like to put a disclaimer. In the statistics which have been gathered, we are not warranted in saying that diphtheria may be successfully combated alone by the use of its antitoxin serum.

Dr. Benjamin Lee.—I desire to make simply one suggestion. The challenge of the chairman was taken up seriously by but one gentleman, and it is evident that his observations had scarcely been of that careful and scientific character which would let us place them in the balance against the admirable and careful report of Dr. Kinyoun. One suggestion, however, which he made, I think may be noticed, and that is that in certain of the cases in which the serum was used, paralysis developed. Some physicians do maintain that after the use of the serum, more cases of paralysis occur; others with a very large experience claim that they have had no such results. I am inclined to the former opinion, and my explanation of the fact, if it be one, is as follows:

As a rule, the cases which result in paralysis are severe or even desperate ones. Suppose that in a certain number of cases which are desperate, and of which we will say 90 per cent. would die, the serum is used; and let us farther suppose that in consequence of the use of the serum one half of these cases are saved, do you not see that there is a possibility that among the saved cases there would be a number of cases of paralysis? But for the use of the serum, they would not have lived to develop paralysis.

A PLEA FOR THE DOMESTIC DISPOSAL OF GARBAGE.

By N. E. WORDIN, A. M., M. D., Bridgeport, Conn.

Man is evermore his own greatest enemy, and life is a constant battle against self. This is eminently true in morals; the evil which is within us, that we do. It is as true in nature; that which cometh out from a man defileth him. How can we escape our own pollution? How can we avoid the dangers which others unwittingly inflict upon us?

The proper disposal of refuse is one of the most difficult problems of government; a problem which has cost our cities much in money, and one, the failure of which has involved many lives.

I might narrow the statement, and say that the proper disposal of its *garbage* is one of the most difficult problems in municipal affairs. As for sewage, seaboard towns and settlements run theirs into the sea. Inland towns and cities use broad irrigation, filter-beds or chemical precipitation. Waring's method is practical, and is even in use for single dwellings with ample grounds. But the question of garbage disposal has until lately lacked scientific investigation or certain statement. It has not been satisfactorily settled. This was the report of the Committee at the Montreal meeting. But much has been done since, and to-day, for the first time, the Committee on Disposal of Garbage makes a definite report. Methods practised in the rural districts will not answer for a large population. Burying in the ground, throwing broadcast over the field for fertilizer, dumping into some stream, feeding to the omnivorous hog;—all these have been used. Some of them have been in vogue until very recently; but advanced ideas lead now to the condemnation of them all.

Fire is conceded to be the best destroyer. It leaves no filth, no germ, behind. Yet there are various kinds of furnaces, burning coal, oil, or gas, and many cities decline to have any of them. The reduction process combines utility with necessity, and this method is gaining the ascendency over cremation, because it may, perhaps, be made profitable pecuniarily. And yet many of these methods are as yet in the experimental stage, and all of them require expensive machinery and plant.

The different methods of disposing of garbage have been tabulated by one writer, as follows:

The most wasteful—Sea disposal.
The most offensive—Hog feeding or fertilization.
The most economical to operate—Reduction.
The most sanitary and complete—Cremation.

Reduction and cremation are the only methods worth consideration for any city. Buffalo, Detroit, Milwaukee, St. Louis, Cincinnati, Bridgeport, Conn., use the former; Wilmington, Del., Camden, N. J., Atlanta and Savannah, Salt Lake City, Lowell, Richmond, Atlantic City, are some of the cities which have crematories. Philadelphia has both methods. New York has adopted the reduction system.

But grant that cremation is the most complete and that reduction turns waste into wealth; that the former is hygienic, the latter economic: I do not consider the problem solved. Garbage can be burned if it is dumped into the heated furnace; can be prepared and pulverized if poured into the tank, but—it is not easy to obtain it; to collect it in the winter, solidly frozen; to get it in the protracted heat of summer, such as we have recently passed through, when mere existence is a burden and every untoward thing becomes exaggerated almost beyond endurance; to rake it out of the corners and separate it from the cans which once contained it; to dump it out from the reeking, slimy tubs where it sours and simmers in the sultry sun; to dispute possession with the sly rats, the ever-present cats, and the yellow dogs of all the neighborhood. The garbage collector is proverbially uncertain. He is a menial, and has no aspirations beyond his daily life. He is generally not intelligent, and therefore mechanical in his work. He is not sensitive by nature and has not the impulse of a quickening conscience. And so, for various reasons, our neighbor's garbage pail is not emptied, and it becomes a nuisance. It actually, if we believe ourselves, breeds disease; but there it stands, full and overflowing. It is a well-known fact that practically a large proportion of garbage is uncollected in our cities. The following table, taken from the "Report on the Final Disposition of the Wastes of Western New York," by the Department of Street Cleaning, under George E. Waring, Jr., the commissioner, shows how this quantity varies:

TABLE SHOWING QUANTITY OF GARBAGE PER CAPITA COLLECTED.

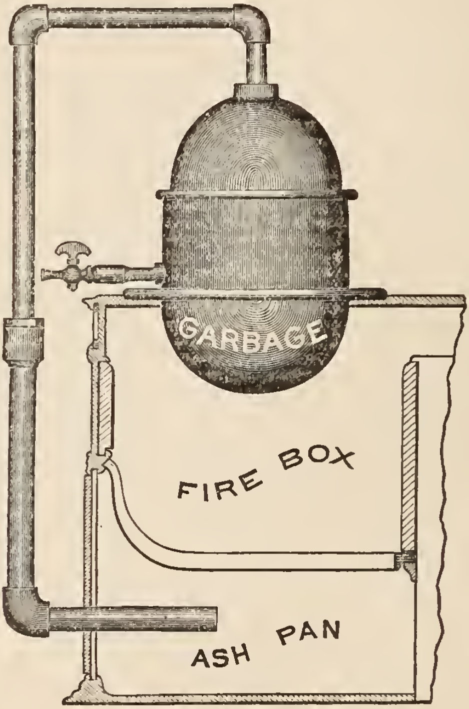
Boston	0.946 lb. per day.
New Bedford	0.890 " "
Wilmington	0.805 " "
Cincinnati	0.566 " "
Lowell	0.408 " "
Philadelphia	0.332 " "
St. Louis	0.277 " "
Buffalo	0.245 " "

This has been the result obtained where the work has been done by contractors. Mr. Waring, and there is no better authority, maintains that the work of collecting and disposal should be done by the city itself. In an article in the *North American Review*, July, 1895, he says: "The municipality should, in the interest of the public safety, as well as of the public finances, take up and carry on for itself, or through contractors whom it could control completely, the whole business of removing from houses whatever householders may wish to get rid of and will not take the trouble to carry for sale to a dealer." "All garbage is a nuisance unless brought under proper control. Such control cannot be exercised by the city unless it takes possession of the entire field." Atlanta claims to have the "safest, most economical and sanitary system of collecting all the garbage, combustible waste, night-soil, street sweepings, and ashes, of any city in the United States." The city collects all forms of waste, and lets no contracts at all. Atlanta and New York are the only cities which have undertaken such a task. (If any desire to pursue this part of the subject further, they will find Atlanta's method explained in *The Annals of Hygiene*, October, 1895, pp. 615–619.)

The problem of complete collection of garbage remains to be solved. The domestic destruction of it will obviate the necessity of any collection. Let each family care for and dispose of its own refuse. All the trouble comes from trying to put it off on some one else. By doing it ourselves we entirely dispense with the garbage bucket and all its attendant evils and dangers. We save the cost to the city of carrying the garbage away from the house and the cost of disposing of it. We conduce to public cleanliness and health in the most approved manner. No extra fire is necessary. No garbage is formed, because the refuse is thrown into the cremator as the plates are cleaned, before fermentation, when no offensiveness is possible. Again let me quote Mr. Waring. In his letter of last February to Mayor Strong, he says: "It may be that the amount of garbage to be handled will be greatly reduced and that the reduction will relate largely to its richer and more valuable portions, as a result of the introduction of the household process of destruction or carbonization in connection with the kitchen fire. After several months' use of this method in my own house, and with a good deal of knowledge as to its use elsewhere, I am inclined to believe that this, or some similar device, will solve a large part of the garbage problem. A servant can readily be taught to use one of these kitchen articles. She will prefer to do it rather than to endure the flies which gather, or to run out of doors in the heat, the cold, or the storm to empty the garbage. She will rather empty the carbonized particles into the fire than wash the sour swill bucket. And she can be easily taught to *destroy* the kitchen waste."

A number of devices have been made for accomplishing this—some simple, others more complicated. I have been able to find but little literature on the subject, but have learned of four appliances for the domestic disposal of garbage. Three of them are set upon the stove, into the pot-hole. One of these is called "The Manser Range Garbage Cremator." It is the simplest possible arrangement, the garbage being simply put into a pail made with a collar which sits down into the fire. It is covered with a lid and perforated with holes for air. It is advertised to destroy all garbage in from twenty to forty minutes, and is a cheap and very simple device. I have only a representation of it in a printed circular.

Another one is named "The Pot-Hole Cremator." It is like an ordinary boiling pot, covered; is eleven inches in diameter and twelve in height. The bottom is cast-iron, with a collar setting into the stove. This collar, as well as the cremator, is divided into two sections, one of which, the smaller, goes farther into the fire than the other. In the larger chamber a wire basket is hung, into which the garbage is put. This basket hangs from the wall which divides the cremator. The heat passes up the larger chamber, comes in contact with the garbage suspended in the wire basket, dries it, chars it, renders it fit to be burned, passes over the top of the division wall, down through the smaller chamber to the fire, where all fumes are destroyed. I have myself used the apparatus, and find it effective.

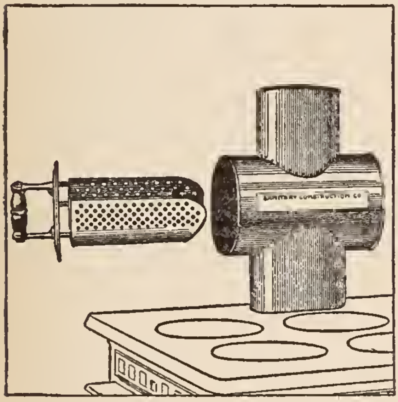


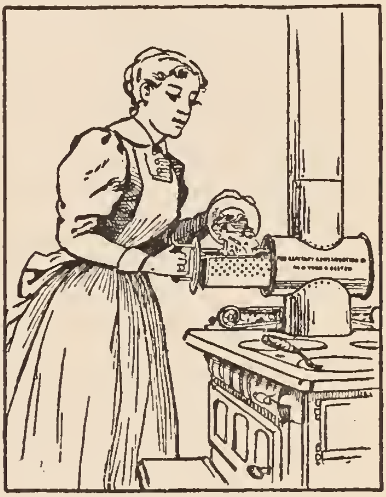
Dr. Benjamin Lee, of Philadelphia, a distinguished member of this Association, testifies regarding it: "I have watched with much interest the practical working of one of your 'Domestic Garbage Cremators,' on my kitchen range, and can testify to the fact that it will consume table and kitchen refuse without producing the slightest odor. I believe it to be a valuable invention."

However, other kinds of appliances for the same purpose rendered improvement necessary in this one, and the inventor writes me that he has discarded it, and has one of a new style which "does perfect work under all conditions and does it quickly, with no expenditure of fresh fuel."

Another apparatus has been invented by Dr. M. L. Davis of Lancaster, Pa., who is the patentee also of a very meritorious garbage furnace. He describes it as follows: "A cast-iron pot which is set in the stove. The garbage is placed in the pot, and a tight-fitting cap of Russia iron is put over to cover it. From the crown of this cover a pipe leads down to the ash-pit of the stove. The smoke is carried off through this pipe and is burned in passing up through the fire. Air is supplied through a pipe in the pot."

Dr. Davis very kindly sends a cremator for our inspection to-day. It seems to be very complete and well calculated for its purpose. Either of these utensils ought to destroy the garbage without injury to stove or pipe, and without any odor.





The fourth apparatus, called "The Household Garbage Carbonizer," is familiar to many members of this Association. It was shown in the photograph at the meeting in Montreal. We have it here on exhibition to-day. It consists of two parts, the basket or receptacle for the garbage, and the cylinder or jacket into which the basket is set. The cylinder is made of Russia iron and varies with the measurements of the pipes, the flue, and the kind of stove. The area of space around the basket when set in the cylinder is larger than the area of the pipe from the stove, so that there can be no obstruction of the draught.

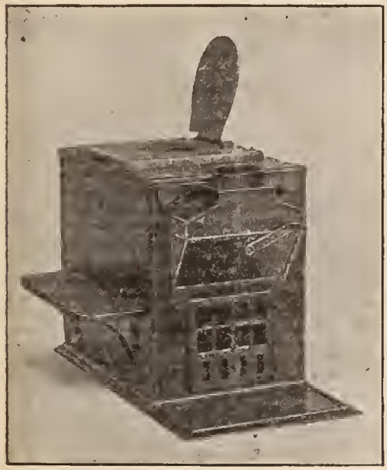
Dr. Durgin, chairman of the Boston Board of Health, says concerning it: "If this apparatus were brought into general use, it would stop the well-known nuisances of more than 50,000 swill buckets in this city, bring a healthful convenience to as many families, hotels and restaurants, relieve our streets of swill carts, save our treasury nearly $200,000 annually, and spare the Health department many other annoyances." The health commissioner of Buffalo, Dr. Wende, says: "I have no hesitation in recommending this particular carbonizer, or of urging the adoption of this way of solving this important domestic problem."

And the subject of cost is no inconsiderable one. Buffalo, with a population of about three hundred thousand, pays $35,000 per year to the Merz Company to receive and dispose of its garbage; Detroit, with 250,000 population, pays annually $63,000 for collection and disposal by the same process; Milwaukee, with 250,000 people, pays $24,000 for disposal by the same company. In St. Louis, the Merz Company receives and reduces all garbage and offal at $1.80 per ton. In Boston, the cost of collection of garbage is $182,000; in New York, $450,000, and in Chicago, $500,000. —*Annals of Hygiene*, November, 1895, p. 707.

I have thus far spoken of the various ways of disposing of the garbage of a city, and have showed that the only two in vogue are cremation and reduction; that the former is the most complete and that the latter may be made to yield a revenue. I have dwelt upon the difficulty of gathering the garbage, have called attention to the evils and the unpleasantness of the swill pail, have suggested a remedy in having each family dispose of its own garbage, and have shown three different kinds of apparatus by which this may be accomplished. I can now go still further, for the thoughtful attention which this subject of waste destruction has received is shown in other arrangements devised for the purpose. Not only is garbage destroyed within the walls of the house, but human excrement as well, so that the cess-pool, that dangerous hole in the ground, may be abolished, the problem of sewage rendered easier, typhoid fever lessened, and sanitation assisted in many ways.

There is now constructed for schools (and of course it may be done for other buildings) cremating closets. These are in the building, and provide for the entire destruction of excrement and urine by fire. They are purified by fire, and all matter, all germs, destroyed by it. I know of but one company which does this work, the Fuller & Warren Warming and Ventilating company, of Boston. They have ninety-five of these closets in school-houses in the state of Massachusetts alone, while in my own little state there are four. Desiring, for the present purpose, to know their practical working, I wrote to Dr. A. R. Goodrich, of Vernon, a man of standing in his community, and he replies enthusiastically, as follows: "It gives me great pleasure as one of the Building Committee, to say that the building has been occupied some three years. No complaint has been made of it during that time. The sanitary arrangements are perfect, particularly in the urinal department, where the air is as free from odor as in any part of the building. The cremation of feces is perfect; no smell to disturb any one. It is done in the night, and as often as necessary. I feel satisfied that the whole committee would say amen to all and more than I have said." A favorable opinion comes to me also from the school in Naugatuck.

What a dainty luxury would a household garbage and excrement crematory be in a home! I did not know of such a thing until I saw its advertisement in the programme of this meeting. It is kindly furnished for our inspection to-day. Placed in the cellar where the draft is strong, and used at night, all the filth and waste of every kind in the house would be completely at the housekeeper's disposal. Exhibitions of its practical working are being given in Buffalo every day of the meetings of this Association. The accompanying illustrations show it in detail.



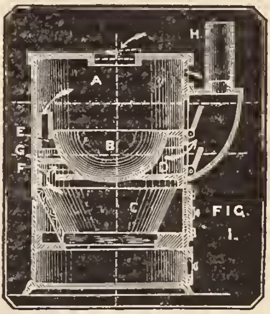
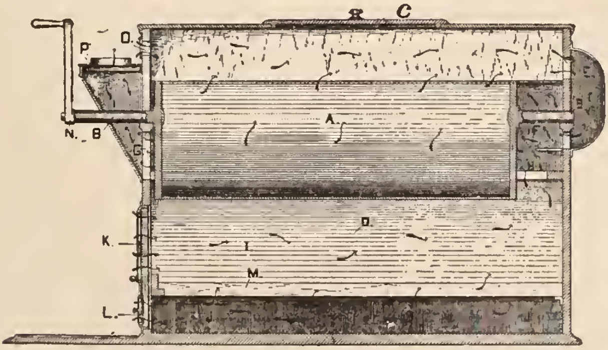


FIG. 1.



Much may be done in the household destruction of garbage. I believe the field is a fertile one. It has been hitherto but little worked. It is more than two years since the garbage cart has stopped in front of my house, or its attendant passed my dining-room windows. Suppose my neighbors should combine with me and destroy their own waste. Then the swill wagon would no longer appear on the street. We must interest the ladies in this, and they must interest their servants. Let health boards and health officers urge upon the people of their state and town this disposal of waste as the cleanest, the healthiest, the best method of dealing with this necessary evil. That they may do so is my only reason for bringing it to their attention to-day. I have no interest, other than a strictly sanitary one, in any appliance, and the exhibits have been kindly made at my request, to demonstrate the practicability of the subject.

MUNICIPAL RESPONSIBILITY FOR HEALTHY SCHOOL-HOUSES.[1]

By Mrs. ELLEN H. RICHARDS.

It has come to pass in the development of the social order that the protection of the more or less helpless individuals of the community, children, women, and wage-earners, is secured by legal enactment carrying penalty for failure to comply with such laws.

The chivalry and justice of man cannot be depended upon in cases where self-interest in the acquisition of money or power is concerned.

As a consequence, the statute books of every country show an increasing number of employers' liability acts, of laws regulating the employment of children in mills, of women in mines, of regulations as to the amount of air per minute per man in coal mines, of the number of cubic feet of air-space per individual in dust-producing manufactures.

Furthermore, the state recognizes certain occupations as dangerous, and requires the employer of labor in these occupations to take all possible precautions for the health and safety of his employés, in order to reduce the danger to a minimum. The state holds the employer strictly responsible for neglect in complying with the law, whether such neglect is due to carelessness or to cupidity, and only when he can show that he has done all in his power toward this end is he free from claims for damages to individuals in his employ.

Most mine owners and manufacturers find it pays better in the end to conform to the legal requirements, for they not only suffer heavy loss when an accident does occur, but also the men are frequently in a position to demand higher wages or to refuse altogether to work under conditions known to be illegal.

The same sense of justice and recognition of the principles of social economy which regulate the quantity of air sent down the mine shaft to the miner, placed where he is powerless to help himself, should extend its interest to the teachers and children of our public schools, who are present in buildings belonging to the city and are under strict legal compulsion to remain in them a fixed number of hours per day, whatever their condition, under penalty of arrest for truancy or neglect of duty.

The facts of ownership of the building and of compulsory attendance, place the municipality under obligation to surround the scholars with the best of hygienic conditions.

While there may be a question whether the tendency to hold the individual employer of labor responsible is not liable to be pushed too far in the social struggle for power, there can be no question of the responsibility of a great and supposably enlightened municipality, with all expert wisdom at its command, for the condition of the buildings it provides for its school children.

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[1] Read at the Buffalo meeting of the American Public Health Association.

It is held to strict account if a broken bridge or a neglected road causes the injury or death of an individual, and a penalty is exacted for such failure in duty.

The death by drowning of four children at Castle Island last July caused exclamations of horror throughout the community and an instant attention to conditions existing at the time of the accident, and all good citizens applauded the mayor in his effort to so fix the responsibility that no such excuses as were plausibly made could be valid in the future.

In this same city the deaths of some 200 children during the year caused no ripple of excitement—for months no public attention was called to the conditions which probably led to this unnecessary sacrifice of human life—and even after the public press had given the note of warning, sounded with no uncertain sound by the mayor, the health authorities, and the director of physical training, a plea of expense, a squabble of petty politics, and a laxness of the sense of moral and legal responsibility, common among semi-official bodies, bid fair to allow the same conditions to continue for years to come as they have for years past.

The power behind the throne, the great tax-paying public, must be roused from its apathy in regard to sanitary matters, and must demand as a factor in education, the provision of buildings which fulfil the conditions known to be essential to health, and must hold the city officials strictly accountable for the neglect of such conditions.

The question of healthy school-houses has been agitated from time to time, and papers on the subject will be found in the reports of various state boards of health, notably of Massachusetts, 1871, Michigan, 1873, New York, 1882; and city boards have not been blind to the needs, as shown by the report of the Metropolitan Board of Health, New York, 1872, Board of Education, Philadelphia, 1875, City Board of Health, Boston, 1875, 1880, 1890.

Nevertheless, it is as true to-day as when the words were written in 1882, that "In numerous towns, villages, and cities, as shown in the report (N. Y. State Board of Health), there is a disgusting, degrading, and harmful neglect of sanitary cleanliness in and about the school buildings."

The further statement in the next clause is even more imperative to-day than it was then: "Such neglect of cleanliness and decency should be interfered with and prevented by local sanitary authority. The public health, the bodily welfare of the children and their moral safety alike require that this duty shall be attended to promptly and by peremptory orders, wherever necessary."

If any one doubts the statement that school-houses need to come under the strict enforcement of the law, let him make a careful canvass in his own city and ascertain the efficiency of ventilation, the condition of the sanitary arrangements, and the degree of cleanliness as to floors and desks.

In a canvass of this kind made in Boston last year by the local branch of the Association of Collegiate Alumnæ, fully one half of the school-houses were found to be in a condition deleterious to health, from one or all of the above causes.

In support of this statement is the report of the city board of health, that during the year the inspectors found 5,053 cases of throat troubles among the children, undoubtedly traceable to dust and poor ventilation, accompanied by under- or over-heating of the rooms. To this may be added the statement of the director of physical training, that the death rate of the teachers in the Boston schools is larger than that in any other city.

In 89 school buildings cases of contagious disease occurred; in 80, diphtheria; in 59, scarlet fever, and in 41, measles.

There is no reason to suppose that Boston is more lax in holding its officials to their responsibility than other cities, and facts and figures gathered there may doubtless be taken as typical of the conditions in many other places. Out of 186 school-houses examined by the Committee of Collegiate Alumnæ the number of those having modern ventilation was only 16, and in only 13 the required amount of air per minute per pupil was found.

In 27 schools less than 150 cubic feet of initial air-space was provided, as against 250 required.

The legal requirement is a supply of 30 cubic feet of air per minute per pupil. Twenty-four rooms in 10 buildings were examined, 6 of these, or ¼ of the whole, showed less than 8 cubic feet per minute per pupil; 8 rooms gave between 8 and 12 cubic feet, and only 3 rooms showed over 20 cubic feet.

And these conditions of poor ventilation exist in buildings, many of which are thirty to fifty years old; besides, the floors of 77 of them, or 41 per cent. of the whole number, had *never been washed* since laid, until the summer of 1895, and it appeared that many escaped the wave of cleaning even then.

The feather duster is ubiquitous, and it is the practice, sanctioned by the rules of the school-committee, to stir up by its use in the morning the dust which has settled upon the desks, just in time to greet the pupils as they enter, and to fill their throats with the germs which cannot fail to be present under such conditions. Moreover, from ignorance, indolence, and a mistaken idea of economy, the school-houses are not well aired during the evening and night, but close, stagnant air, laden with the dust of ages, greets teacher and pupil. What wonder that the windows are thrown open and cold air allowed to fall upon the tender bodies, heated with the hurry to school, causing colds, if not pneumonia!

Nor are the sins of dust and cold air the only ones to be reckoned.

A total of 126 old-style flush and privy vaults still remained, after having been *condemned year after year* by the board of health.

Is there not need of some shock which will shake the public out of its fatal apathy when the recommendations of its board of health fall unheeded upon the ears of city officials? Are there not some weak points in the organization which render possible such a state of things?

The mayor of Boston has said that there is no more urgent duty which the municipality owes to its citizens than that of providing healthful conditions for its schools. He also gave it as his belief that the division of responsibility between several branches of the city government allowed an escape from the penalties which otherwise might be exacted.

Local agitation may do some good, but it seems as if the time had come for some concerted action,—perhaps by the American Public Health Association, and some pressure brought to bear upon city authorities to compel them to keep their property in good condition. Perhaps the most efficient way would be to invoke the power of the law, and to insist that such buildings as are flagrant violations of the law shall be closed, as private buildings would be.

If such action could be taken by each State Board of Health, an impression might be made which would have a lasting effect.

It is probably within the limits of truth to state that if the laws now on the statute books were enforced as strictly in respect to school-houses as to private houses and places of business, there would be 20,000 children on the streets of Boston next September, on account of the closing of buildings which have been allowed to be used year after year in defiance of all legal and moral law.

That this charge of the city's neglect of its own buildings is well founded may be seen from two or three sentences in the report of the expert commission appointed in 1896 by the mayor of Boston, on the "Sanitation of School-houses":

> "Inside the buildings are constantly met conditions showing lack of expert knowledge and judgment in permitting certain things to be done in the way they are, and in continuing old methods that would not be allowed an instant in progressive private work."

> "If cases like these came within the observation of the Health Department in their inspection of private houses, alterations would be peremptorily ordered, with the alternative of closing the building against all occupation."

How lax a city government may become, is seen in the fact that only 27 out of the 186 school-houses of Boston were found to have anything like adequate fire escapes.

The employés would be justified in refusing to work in any factory under such conditions; why would not teachers be sustained in demanding protection while in the performance of their duty?

It has been stated that defects in ventilation and in working space surpass in their disastrous effects on the health of the employed all other injurious conditions taken together, whether the disease-producing agent be dust, or noxious vapors, or gases, or heat, or a distinctly poisonous material.

It would seem, therefore, that among the occupations classed as dangerous in modern times, that of the public school teacher must be included, and that the usual safeguards must be so extended as to make it possible for such employés to obtain legal redress for injuries to health received in fulfilling the duties required of them, and, furthermore, public-spirited citizens should see to it that the city is as surely held responsible for deaths of school children occasioned by municipal neglect as for the deaths of those who are killed by a falling bridge.

JOURNAL

OF THE

American Public Health Association

Publication Committee { IRVING A. WATSON, M. D.
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Secretary American Public Health Association, Concord, N. H.

ANNUAL VOLUME, NO. XXII. JANUARY, 1897. QUARTERLY SERIES. VOL. 3, PART 1.

IMPORTANCE OF ATTENTION TO HEALTH.

The importance of attention to health, both public and individual, is nowhere better illustrated than in the returns of the workingmen's sick clubs of Germany. In these clubs, in 1891, out of a total membership of six and a half millions, more than two million cases of sickness occurred, the average duration of which was seventeen days. These clubs paid for medical expenses $21,500,000.

Since it is safe to assume that among the remaining forty-four millions of the German population, twenty-four millions of whom are old enough to work, the cases of illness were equally numerous and prolonged as among the members of these sick fraternities, the cost of sickness in Germany in 1891 is not reckoned too high at $120,000,000. In this sum the losses due to the loss of wages are not included.

The decline in the death-rate usually accompanying regular sanitary supervision may be considered as a standard for estimating the gain to the community arising from such supervision, as shown by the following example, furnished by Professor Pettenkofer:

"There were in Munich, before 1877, 34 cases of illness, each averaging 20 days, for each registered death. The mortality in that city diminished in the period 1877–'92 from 33 per 1,000 inhabitants in the former year to 26.1 per 1,000 in 1892, or a decrease of nearly 7 per 1,000 inhabitants. Hence in a population of 373,000, Munich had 2,611 fewer deaths in 1892 than in 1877, and its people were spared, in round numbers, 1,750,000 days of illness in 1892. Assuming that each day of illness costs 36 cents for nursing, medicine, etc., Munich was saved a cost of $600,000 by means of this decrease in illness, an average saving of about $1.92 per capita, or nearly nine dollars and a half per family of five persons."[1]

INFECTIOUS DISEASES.

Dr. Esmanch[2] states the mortality of infectious diseases in Germany for the ten years 1881–'90, as follows, in terms of the total mortality:

Diphtheria and croup	4.49 per cent.
Measles	1.30 "
Scarlet fever	1.39 "
Typhoid fever	1.09 "
Consumption	13.19 "
Acute lung diseases	11.11 "
Acute diarrhœal diseases	10.32 "

Anthrax in London.

In the annual report of the medical officer of health for the administrative county of London, for 1894, Dr. Hamer presents a summary of the history of the prevalence of anthrax in London, with a detailed statement of the cases,—119 in all, of which 27 were fatal, and which occurred in the 21 years, 1873–'93.

The apparent source of infection was found to be as follows:

90 cases occurred in persons engaged in the hide and skin trade.
5 cases occurred in persons engaged in slaughtering animals.
7 cases occurred in persons engaged in the manipulation of horse-hair, or the manufacture of brushes.
1 case occurred in a person employed in a bacteriological laboratory.
16 cases occurred in a person in whom the source of infection was not traceable.

The remedial measures proposed to prevent the occurrence of anthrax were much the same as those proposed to the Local Government Board by Dr. Spear, several years earlier, and are, briefly, as follows:

1. The establishment of an organization by which authorities may be notified of the existence of the disease among cattle, with the view of prohibiting the importation of suspected hides. This measure was deemed to be impracticable.

2. The general adoption of some process of *curing* which would serve to destroy the morbific germs.

3. A classification of hides at the port of export, by which those removed from the dead animal could be separated and afterward dealt with under strict precautions.

4. Prophylactic or palliative measures, applicable to individual workshops and individual workers.

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[1] Gesundheitsbüchlein. Deutsche Kaiserliche Gesundheitsamte, Berlin, Julius Springer, 1896.

[2] Dr. E. V. Esmarch, Hygienisches Taschenbuch, p. 189.

The author adds the following comment:

"It is most important that no one should handle hides who is ignorant that the employment is a source of possible danger, and it is desirable that the employer should recognize that he has neglected to take reasonable precautions against risk of injury if he has failed to acquaint the workmen with the possibility of danger, and with the nature of the steps to be taken in the event of any suspicion of mischief."

Infectious-Disease-Hospital Accommodation.

A. W. Blyth, *Journal of Sanitary Institute*, October, 1896, page 335:

"To summarize the chief points in my address:

"1. The provision of due hospital accommodation in every district is a duty and necessity.

"2. The local authorities and the public must not have too great expectations of the result of this hospital accommodation in arresting epidemics of scarlet fever, of diphtheria, or of measles. Epidemics are pandemic in their nature, and depend on some obscure and general cause. Probably most of the contagious living particles have a life external to the body, a life the phases and history of which are at present unknown.

"3. The increasing and great fatality of measles, the general neglect of precautions to prevent its spread, point to the urgency of the joint measures of compulsory notification, and the provision of hospital accommodation for that disease.

"4. The expense of efficient, attractive hospital accommodation may be, without injury, slightly decreased by departing from the rules sanctioned by the Local Government Board, by giving ample floor space, but a smaller cube than 2,000 cubic feet to children.

"5. The suggestion in times of pressure as to the treatment of fevers in shelters admitting sunshine and air from the south side may, I trust, have careful consideration and practical trial."

TABLE SHOWING PERCENTAGE OF CASES OF INFECTIOUS DISEASES TREATED IN HOSPITALS, ENGLAND, 1892.—*A. Winter Blyth, Journal of Sanitary Institute, October, 1896.*

DISEASES.	Cases calculated from deaths, 1892.	Cases treated in hospital, 1892.	Per cent. of total cases treated in hospitals, 1892.
Scarlet fever	122,622	30,488	24.8
Enteric fever	23,640	2,710	11.4
Diphtheria	26,208	3,093	11.8
Small pox	5,963	3,691	60.2
	178,433	39,982	22.4

The Spread of Diphtheria.

Dr. L. C. Parkes of London, England, concludes from seven years' observation of the prevalence of diphtheria in the Chelsea district that "There does not appear to be any very marked association between diphtheria and insanitary condition of houses. The fact that the sanitary condition of the parish is steadily and progressively improving year by year, whilst there is no diminution in diphtheria prevalence, lends no support to the view that insanitary conditions play a large part in the production of diphtheria."

He further says in addition that "There is little to be said that will be reassuring to those who regard diphtheria as an eminently preventable disease. It may be so in isolated districts, but the conditions of metropolitan life are distinctly adverse to its prevention and extinction. There would seem to be most prospect of success in the adoption of some system which would prevent the spread of infection in the elementary schools. The closure of the schools is not a practicable method unless the necessity is great. It cannot be said that there has hitherto been any such wide-spread diffusion of the disease as to justify school closure. It would, however, I think, be productive of good if the school authorities could see their way to institute periodical medical examination of school children, with a view to prevent the attendance of those whose throats present suspicious indications."

FOOD AND DRUG INSPECTION.

The parliamentary commission appointed to inquire into the operation of the Food and Drug Laws of England, reported in 1896. The report comprises a document of about three hundred pages, and much of its contents are concerned with legal matters and the operation of the Food and Drug Acts.

Considerable attention is very properly given to the subject of milk. The following was shown to be the result of the analysis of many samples of mixed milk, covering a period of thirteen and one-half years and supposed to be normal milk:

Total Solids:	
Maximum	13.06 per cent.
Minimum	12.68 "
Fat:	
Maximum	4.22 per cent.
Minimum	3.91 "
Solids not Fat:	
Maximum	8.88 per cent.
Minimum	8.68 "

Several large farmers testified that they had no difficulty in furnishing milk having 3.25 per cent. of fat and 8.75 per cent. of solids not fat.

American authorities, generally, will hardly agree with the conclusion of the commission relative to coloring matter. Upon this point the commission says, "It is difficult to see much force in the contention that the coloring of milk with anatto should be prohibited."

In those American cities where the coloring of milk has been vigorously suppressed, an improvement in the quality of the milk has invariably been the result; since, in the majority of cases, the practice of coloring is adopted to conceal fraud, and this form of adulteration is usually found to exist in connection with other forms of tampering.

The following summary presents the principal recommendations which were made to parliament upon this subject by the commission:

Summary.

1. That in districts other than county boroughs, where the local authorities fail to put the acts in force, the county council should, by their own officers, take samples for the purposes of the acts.
2. That in connection with the sale of mixed articles, it should be obligatory upon the vendor to supply the purchaser with a label setting forth that the article is mixed.
3. That the statement of admixture on labels should be legibly and distinctly printed and so as not to be obscured by other printed matter, and that existing labels should be subject to the proviso mentioned in the concluding paragraph of the section of this Report headed "Labelling and Sale of Mixed Articles."
4. That, subject to the limitations indicated in the Report, invoices and equivalent documents should have the force of warranties in the cases of all articles to which the Sale of Food and Drugs Acts apply.
5. That the commissioners of customs be authorized to examine and take samples of all food imports at the port of entry, with a view to subsequent action, as indicated in the body of the Report.
6. That dealers who obtain supplies of foods from abroad should be required to submit to the customs guarantees of purity given by the foreign vendor, together with evidence that they have taken measures to see that the goods are such as they are guaranteed to be.
7. That retailers should be empowered to refuse to sell an article otherwise than in a manufacturer's unopened labeled tin or packet.
8. That the powers of section 3 of the Sale of Food and Drugs Act, Amendment Act, 1879, as to the taking of samples of milk in transit, should be extended to other articles.
9. That the maximum penalty for refusal to sell a sample to the authorized officer be increased.
10. That the division of the sample after purchase and delivery of a portion to the vendor should be compulsory.

11. That samples should be divided into four instead of three parts, and that one of these parts should be at the disposal of the wholesale dealer.

12. That the provisions of section 5 of the Margarine Act, 1887, as to the exemption of an employer from penalty in certain cases, and punishment of an assistant, should be extended to offenses under the Sale of Food and Drugs Act.

13. That it should be obligatory upon the magistrates or court to refer articles to the government laboratory for analysis, when such course is desired by either of the parties to the case.

14. That a defendant who proposes to rely upon the warranty defense should be required to intimate this to the prosecutor within a reasonable time of the service of the summons.

15. That the time allowed for appeal to quarter sessions from decisions of local justices should be extended from three to fourteen days.

16. That any person guilty of a second offense under the Sale of Food and Drugs Act should be liable to a minimum penalty of 5 l., and that in respect of the third or subsequent offenses under those acts and the Margarine Act, 1887, the punishment of imprisonment without the option of a fine may be inflicted at the discretion of the magistrates or court.

17. That magistrates should be authorized to make orders, at their discretion, requiring a person convicted of offenses under the acts to publish a notification of his conviction in the public press of the locality where the offense occurred.

18. That the definition of the word "food," as used in the acts, should be amended so as to include expressly all articles intended to enter into or be used in the preparation or flavoring of food.

19. That an authority should be constituted who should act as a Court of Reference upon scientific and other questions arising under the acts, and who should be empowered, at their discretion, to prescribe standards and limits of the quality and purity of food.

20. That candidates for appointment as public analysts should be required to produce evidence that they possess the requisite knowledge of analytical chemistry, in the shape of a diploma or certificate given in respect of such knowledge by a recognized school of chemistry, or scientific examining body, and that in the case of candidates other than duly registered medical practitioners, specific tests of the requisite knowledge of microscopy and the bearing of adulterations upon health should be prescribed.

21. That the remuneration proposed to be given to a public analyst should be subject to the approval of the central authority.

22. That the artificial coloring of margarine to resemble butter or imitate butter be prohibited.

23. That the mixing for sale of margarine and butter be prohibited.

Milk Standard.

The Ohio legislature has reduced the standard for milk in that state from 12.5 per cent. to 11 per cent. solids, and in the months of May and June to 10.5 per cent. This action was caused by the recent prosecution of several farmers in Cleveland for milk adulteration, in which it was conclusively proved that the sub-standard samples were as obtained from prize dairy cows.

MINIMUM STANDARD OF DAILY DIET APPROXIMATELY CALCULATED.[1]

	Albumen.	Fat.	Carbo-Hydrates.
Each child up to 1½ years of age..................	20–36 grammes.	30–45 grammes.	60–90 grammes.
Each child from 6 to 15 yrs.	70–80 "	37–50 "	250–400 "
Adult man, at moderate labor..................	*118 "	56 "	500 "
Adult woman at moderate labor..................	92 "	44 "	400 "
Adult man, at severe labor.	120–145 "	100 "	500 "
Adult man of advanced age.	100 "	68 "	350 "
Adult woman of advanced age....................	80 "	20 "	260 "

*Of this amount, about 105–106 grammes should be furnished in a form which is readily digested.

SEWAGE FARMS.

Cost of Maintenance.[2]

The cost (yearly working expenses and payments for capital expenditure) per head of the population for chemical precipitation was, in Frankfort-on-the-Main, 1.22s.; in Wiesbaden, 0.68s.; in Halle (without excreta), 0.80s., and in Essen (without excreta), 0.56s.; whereas the cost of purification on land by broad irrigation amounted for the same unit in Breslau to only 0.44s., of which sum 0.22s. is chargeable to the pumping of the sewage. It is clear from these figures that the sewage of Breslau is considerably more cheaply purified than the chemically-treated sewage of the other towns named, and that by adopting this system the city authorities are saving the rate-payers, every year, very considerable sums.

Recent Opinions on Sewage Irrigation.

It has already been stated that Pasteur at one time held opinions opposed to the purification of sewage on land, which were derived from his scientific researches, but that toward the end of his life the great savant—as is generally believed—somewhat modified his views on this point.

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[1] Gesundheitsbüchlein, Berlin, 1896. (Imperial Board of Health.)

[2] H. A. Roechling in *Sanitary Reeord* December 11, 1896.

Professor Virchow, of Berlin, who, as a member of the Berlin town council is intimately connected with the Berlin sewage farms, holds that sewage farms are, in the interests of the public health, desirable and excellent institutions.

Professor Koenig, who is the director of the agricultural experimental station at Münster, and who, as a chemist, has given this matter his most careful consideration for years past, arrives in his well-known book on the pollution of rivers at the following conclusions:

"The most perfect purification of foul liquids containing nitrogenous organic matter can, *i. e.*, if done correctly, be brought about by irrigation. (By this I do not mean to say that, for instance, sewage irrigation is the only and most rational way of purifying and utilizing fœcal matters; this entirely depends on conditions of locality and time; the most suitable disposal of fœcal matters is a question which I cannot touch upon at this point.)"

"Generally speaking, through chemical and mechanical means of precipitation or purification only the suspended matters can be removed; for just as little as we possess effective means for the precipitation of ammonia and potash, just as little do we possess such means for the removal of the dissolved organic matters. The precipitation of the dissolved organic matters can only to a limited extent be assisted by chemical agents of precipitation."

Very much to the same conclusions as Professor Koenig came Allen Hazen, who investigated this matter in 1889 for the State Board of Health of Massachusetts. He states that in addition to the suspended matter, from 22 to 41 per cent. of the dissolved matter was removed from the sewage by the chemicals (lime, copperas, ferric sulphate, and aluminum sulphate) employed by him, and in concluding his report he remarks: "It is quite impossible to obtain effluents by chemical precipitation which will compare in organic purity with those obtained by intermittent filtration through sand."

Mr. Dibden, the chemist of the London county council, expressed similar views in the discussion of the author's paper on the "Berlin Sewage Farms." He remarked that where sandy soil could be found for sewage irrigation, that method was no doubt the best. Ordinary precipitation processes, as he had before the honor of showing to the Institute (of Civil Engineers), would not remove more than a certain amount of the organic matters in solution.

Dr. Dupré is evidently of the same opinion, for in the discussion already quoted, he stated that he knew no one familiar with the subject who denied that the most effective treatment of sewage was by passing it through land, provided the land was suitable.

Concerning the views held by Dr. Edward Frankland and the local government board, it need hardly be repeated here that they are in favor of the purification of sewage on land.

The well-known bacteriologist, Prof. Carl Fraenkel, who has carefully examined these questions, states in an article on "Water Filtration and Sewage Irrigation," as follows: "In principle, therefore, the exclusion of all noxious matters from our watercourses is to be energetically insisted upon, and as the best means for obtaining this end, sewage irrigation must be recommended."

Concluding Remarks.

Innumerable further quotations might be made, but the few opinions mentioned will suffice to show that of all methods of sewage treatment, sewage irrigation occupies a very prominent, if not the most prominent, place and that both leading bacteriologists and chemists have pronounced in its favor.

If the author be permitted to add his own testimony, he would like to say, that he has always been in favor of sewage irrigation where the local conditions favored this course, and he is glad to be able to state that at Leicester a sewage farm of 1,700 acres on stiff clay and with steep falls, the laying out of which was designed by the late Mr. J. Gordon, has proved very successful under the direct management of a committee of the town council. In proof of this, the author would mention that the Leicest[illegible]hire county council, which at first raised various complaints about [illegible] nature of the effluents, congratulated the town council in its last y[illegible] report on the efficient way the sewage had been treated on the farm.

Whilst the author does not wish in the least to discourage other methods of sewage treatment, he believes to have shown that a one-sided condemnation of sewage irrigation is not supported by generally established facts, but that, on the contrary, these facts are strongly in favor of the application of sewage to the land. In this respect he may be permitted to quote from a former paper of his, in which he stated: "Much has been said and written for and against sewage farms, and the question whether chemical treatment or application to land is the better way to dispose of sewage has been fiercely discussed. The battle is still raging, though its din perhaps may be a little more distant, the public at large having grown weary of arguing this matter with no apparent likelihood of arriving at a satisfactory conclusion. The author is of opinion that there can be no general solution of this vexed question, and that a great mistake has been made in the past by over-zealous advocates of the one or the other method, each party considering their own remedy to be an unfailing one in every case. These enthusiasts have thought that a success obtained in some particular case under special conditions could be anticipated under all circumstances, forgetting that like causes may not produce like results, if the conditions under which they have to work are not the same. The question is not so much whether sewage farming or chemical treatment is theoretically the right way to dispose of town sewage, but rather whether in a particular case the one method is more likely than the other to give good results, as every case requires to be dealt with on its particular merits."

Household Waste. Annual Product per Capita.[1]

The German Board of Health estimates that each adult produces annually an average of about

75 pounds of excreta,
750 pounds of urine,
245 pounds of solid kitchen waste, sweepings, and ashes,
80,000 pounds of waste water.

VITAL STATISTICS.

JAPAN.

The population of Japan in 1892 was 41,268,732.

The marriage rate was	8.48 (16.96 persons married).
The birth-rate was	29.25
The death-rate was	21.76
Excess of births over deaths	7.49

The still-births constituted 8.7 per cent. of the total number. [illegible] ratio of male to female births was as 1,047 males to 1,000 females. T[illegible] birth-rate has slightly increased during the ten years 1883–'92, from 26.7 per 1,000 in the first five years to 28.7 in the last five years. The illegitimate births constituted 6 per cent. of all births. The divorces in 1892 were 113,498, or nearly one third as many as the marriages during the year. Employing the Swiss method of comparison, the divorces were in the ratio of 15 to each 1,000 existing married couples.

The deaths of males were 458,970, and of females 439,026; but since the population by sexes is not given, the death-rate of each sex cannot be accurately stated.

The mortality and the prevalence of the principal infectious diseases are shown in the following table:—

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[1] Gesundheitsbüchlein. Berlin. 1896.

	Cases.	Deaths.	Fatality, per cent.
Cholera	874	497	56.6
Typhoid fever	35,636	8,529	23.9
Dysentery	70,842	16,843	23.8
Diphtheria	4,359	2,531	58.1
Typhus fever	281	62	22.1
Small-pox	33,779	8,409	24.9

INFANT MORTALITY.

Professor Seutemann of Tübingen has recently published the following table, giving the infant mortality of certain German districts, classified according to the occupation or social standing of the parents:

INFANT MORTALITY IN PERCENTAGE OF TOTAL BORN.

	Whole Population.	Domestics.	Day Laborers.	Gehilfen.	Private Officials.	Public Officials.	Military.
Berlin	30.26	36.76	37.11	28.44	23.35	22.29	16.62
Schlesia	29.18	35.47	28.10	29.78	25.42	24.58	21.96
Brandenburg	27.72	33.54	29.21	27.06	23.34	23.44	20.26
West Prussia	26.23	40.28	25.91	25.41	22.45	22.19	20.28
Posen	25.07	33.42	24.92	22.93	21.36	21.88	22.12
East Prussia	24.99	33.74	24.99	23.92	21.38	20.50	22.86
Saxony	24.79	33.12	27.07	22.55	22.43	20.80	18.44
Pomerania	23.08	29.07	22.67	23.18	19.51	21.41	22.40
Rhineland	21.60	35.05	23.53	20.44	19.32	19.35	19.40
Hessia	18.83	28.24	20.87	17.92	17.53	16.11	15.67
Schleswig-Holstein	18.39	28.27	18.25	19.37	17.19	14.64	14.96
Hannover	18.20	24.44	18.26	18.21	16.42	15.86	16.10
Westphalia	17.79	23.00	18.28	17.88	16.62	16.52	16.19

URUGUAY.

The births, deaths, and marriages for 1894 were as follows:

Births	28,486
Deaths	13,843
Marriages	3,852
Birth-rate per 1,000 of the population	38.07
Death-rate per 1,000 of the population	18.53
Persons married	9.82
Still-births per 1,000 of the population	1.07

NEW ZEALAND.

The following decennial statement shows the vital rates of New Zealand per 1,000 estimated mean population, and compares the rates for the other colonies during the last year of registration:—

RATES PER 1,000 POPULATION.

NEW ZEALAND.	Births.	Marriages.	Deaths.
1885	34.35	6.65	10.61
1886	33.15	5.99	10.54
1887	32.09	5.97	10.29
1888	31.22	5.97	9.43
1889	30.17	5.94	9.44
1890	29.41	6.12	9.66
1891	29.01	6.04	10.35
1892	27.83	6.23	10.06
1893	27.50	6.22	10.23
1894	27.28	6.15	10.19
Year 1894.			
Queensland	31.86	5.70	12.08
New South Wales	31.48	6.20	12.30
Victoria	29.16	5.98	13.13
South Australia	30.49	6.09	11.64
Western Australia	27.49	6.24	14.00
Tasmania	31.11	5.42	12.42

VITAL STATISTICS OF EUROPEAN COUNTRIES, 1893–'94.

Marriages, Births, and Deaths per 1,000 Inhabitants.

	PERSONS MARRIED.		BIRTHS.		DEATHS.	
	1893	1894	1893	1894	1893	1894
England and Wales	14.7	15.1	30.8	29.6	19.2	16.6
Scotland	13.3	13.4	31.0	30.1	19.5	17.2
Ireland	9.4	9.4	23.0	22.9	17.9	18.2
Denmark	14.1	13.9	30.6	30.2	18.9	17.5
Norway	12.9	12.8	30.7	29.7	16.3	16.9
Sweden	11.3	....	27.4	....	16.8	....
Austria	15.9	....	37.9	....	27.1	....
Hungary	18.6	....	42.5	....	31.1	....
Switzerland	14.7	14.9	28.5	28.2	20.5	20.7
Germany	15.8	15.9	36.7	35.8	24.6	22.3
Holland	14.6	14.4	33.8	32.7	19.2	18.5
Belgium	15.2	15.1	29.5	29.0	20.3	18.6
France	15.1	....	22.9	....	22.8	....
Italy	14.8	15.0	36.7	35.7	25.3	25.1

The advance sheet of the registrar-general of England, giving the vital statistics of 1895, states the marriages as 227,865; births, 921,860; deaths, 568,758, which upon an estimated population of 30,394,078 for 1895 would correspond to a marriage rate of 15 per 1,000 (persons married), birth-rate of 30.4, and death-rate of 18.7. These figures, he states, will probably be found to differ slightly from the revised returns.

CORRECTION.

An error exists in the article relating to Formaldehyde Gas, by Dr. E. A. de Schweinitz, Vol. XXI, page 363, thirteenth line from top. For "5 per cent. aldehyde," read "about 1.5 per cent. aldehyde." In the sixteenth line for "36, 100 c. c.," read "361 litres."

JOURNAL

OF THE

American Public Health Association

ANNUAL VOLUME, NO. XXII. APRIL, 1897. QUARTERLY SERIES. VOL. 3, PART 2.

The American Public Health Association is not responsible for the sentiments expressed in any paper or address published in this Journal.

REPORT OF THE COMMITTEE ON THE DISPOSAL OF GARBAGE AND REFUSE.

BY RUDOLPH HERING, C. E., NEW YORK CITY, CHAIRMAN.

MR. PRESIDENT AND GENTLEMEN: Owing to the absence of the other members of the Committee on the Disposal of Garbage and Refuse, the chairman begs leave to make the following report:

It has been previously reported that the whole subject must be treated from an economical, as well as from a sanitary standpoint, if satisfactory results are to be obtained. The question of utilization is of secondary consideration. If the cost of disposal can be reduced by utilizing a part or the whole of the refuse, then for financial reasons such utilization should be advocated.

It has also been reported that the sanitary question seems to narrow itself down mainly to the prevention of all nuisance, no evidence having been obtained to indicate a serious effect upon the health of those engaged in the disposal of this refuse, or in picking it over before final disposal.

There are in use a number of methods of disposal. This is due partly to the varying character of the refuse in different cities, as regards moisture, ashes, unburnt coal, animal and vegetable matter, etc., and is partly due to special circumstances which favor one or the other method.

To obtain data for the purpose of discussing the subject, a large number of cities have been visited, and a circular containing pertinent questions has been sent to one hundred and eighty-three cities. It has been somewhat difficult, and often impossible, to obtain all the desired answers, because to give some of them would have required local experiments and investigations which we could not expect the authorities to make. Some of the replies came promptly, others required one or more reminding letters, and in other cases the information is apparently not to be obtained.

Up to the present time one hundred and forty-nine cities have replied, and many of the answers have been written with care and in considerable detail. The entire matter has been edited, copied, and compiled, and constitutes a valuable mass of information concerning the present status of the question in this country, giving the opinions of the various health officers and others who have sent the replies.

As all the expected information is not yet in our hands, and as but one member of the committee has had an opportunity to examine the evidence, only the following conclusions can be drawn at this time :

The terms as defined by the committee are in quite general use throughout the country. In the Southern states, however, the term " garbage " is sometimes applied to dry refuse (Atlanta, Ga.) and to a mixture of dry refuse with animal and vegetable waste. In New England the word " swill " is more commonly used to designate kitchen waste, etc., while in Pennsylvania and one or two other states " slop " is the name applied to this material. The garbage is usually collected two or three times a week, but somewhat more frequently in densely populated districts, and also during hot weather. Ashes and dry refuse are usually collected once a week throughout the year.

Regarding receptacles, regulations as to size, material, and covers are made in hardly one third of the cities, galvanized iron buckets with covers, being generally specified.

Requirements regarding the construction of the carts used for collection are not commonly made, but where this is the case the regulations usually specify water-tight bodies with tight fitting covers.

In only a few cities are the receptacles, carts, etc., required to be disinfected. In many cities where garbage is dumped on land it is found necessary to use some kind of deodorizer. Buffalo, N. Y., presents one of the few instances where the garbage is disinfected in the carts before delivery at the disposal works.

Analyses of garbage, such as are made in Europe, do not seem to have been made anywhere in this country, or, if so, they are not available. The best information obtainable shows that the moisture or water in garbage proper varies from 60 per cent. to 80 per cent. ; the rubbish, such as bottles, cans, rags, etc., about 7 per cent. ; the animal and vegetable dry matter about 20 per cent., and the grease from 2 per cent. to 4 per cent. The ashes from the cremation of garbage constitute about 5 per cent. of the original mass.

The garbage is collected either by private service, by contract, or by department employés. It is found that of the combined total population, 9 per cent. has it collected by private service, 53 per cent. by contract, and 38 per cent. by department employés. In the two cases last named private service supplements the public system, but the exact relation cannot be determined.

The system of disposing of garbage by reduction is used in about twelve cities in the United States. In one of them, however, it has recently been abandoned. Cremation systems, where garbage is destroyed by fire, are used in forty-two cities of the United States. These figures pertain only to those cities from which we have heard and which number one hundred and forty-nine.

A table has been made regarding the cost of garbage collection and disposal, which, however, is not complete, although in a general way certain facts can be deduced. The cities were divided into three classes: First, those over 100,000 population; second, those between 40,000 and 100,000 population, and third, those having a smaller population than 40,000. It being evident that the question should be considered somewhat with relation to the size of the city, they have been grouped in these three classes. Eight of the cities of the first class dispose of their garbage by dumping it on land, and of course in that case no cost was given for the disposal, but simply for the collection and removal. We have among this class of cities four, giving a cost per capita of from 18 to 20 cents per annum for collecting and removing the garbage and disposing of it on land. The smaller cities report the cost as ranging from 11 to 39 cents. In still smaller cities we find the cost ranging from 6 to 12 cents for collecting and disposing of garbage by this method. Very few cities plough the garbage into land. The only one from which the information seems to be reliable is Utica, N. Y., and there the cost is 24 cents per capita per annum.

In those cities that dump their garbage into the sea or river the cost is from 36 to 75 cents per capita per annum. The cost in cities of the next smaller size is from 37 to 41 cents. No cost is given where the garbage of very small cities is dumped into the lake or river.

In cities where the garbage is fed to animals the cost of collection and disposal varies from 28 to 37 cents, and this probably takes into account the revenue which the contractor derives from the sale of this material. In smaller cities the cost of disposal by feeding it to animals is sometimes as low as 9 cents per capita per annum.

The cost of disposal by reduction processes varies from 15 to 67 cents per capita per annum, but in some instances more detailed information will amend these figures. The cost of disposal by cremation is found to vary from 6 to 10 cents per capita per annum in medium-sized cities. In one small city a cost of 20 cents per capita is given.

During the year just past several cities have made contracts for the erection of crematories. The new crematories are generally claimed to be improvements and to work more economically. In reference to reduction processes the most important event of the year has been the contract made by New York city with the New York Sanitary Utilization company for the disposal of garbage, the price being about $90,000 per annum. It contemplates treating the garbage of the whole city by steam, sterilizing it, and then, by great pressure, separating the water and grease from the residue (called tankage), which is salable as a fertilizer. Whether this plant will be successfully operated without causing a nuisance and also be profitable at the above figure remains to be seen. The reduction process which has been operated in New Orleans, La., for a few years has recently been abandoned as an unprofitable venture, and it is proposed to substitute cremation.

The recent progress which has been made in Europe marks an important step in the disposal of city refuse. Experiments made by the cities of Berlin and Hamburg, lasting more than one year, are now completed, the reports are being compiled and have been promised to the committee by the end of this year. Advance reports indicate satisfactory results. In Berlin it has been found that garbage can be destroyed by cremation at small expense without much additional fuel, and in Hamburg without any additional fuel whatever. The furnaces used are similar to those employed in England, namely, the Fryer furnace as improved by Horsfall, and again improved by the city engineers of Berlin and Hamburg.

In Zurich, Switzerland, a report on the disposal of city garbage and refuse by the sanitary inspector and the chief of the street cleaning department of the city has quite recently been issued. These officials visited the best works in England and on the continent. Experiments were made regarding the disposal of the material in their own city and they have reached the following conclusions :

" Destruction of refuse by fire is to be recommended. This method will not entail a greater expense than the more crude methods used heretofore. With the latest improvements and with careful management, no objectionable results will follow in the immediate or more distant surroundings of the garbage furnaces. From a sanitary point of view cremation is the only correct method of disposal, particularly during epidemics. This method secures invaluable service by including, with the material to be cremated, dust and the sweepings from buildings and public streets. During ordinary times this process is also beneficent because it does away with the accumulation of the more or less objectionable matter which otherwise must be dumped in the neighborhood of habitations. The slight and sometimes questionable value of the refuse for fertilizing purposes should not be placed against the much greater value of better sanitation."

In view of the forthcoming reports on the very thorough experiments conducted in Hamburg and Berlin, your committee did not deem it proper to present its final report before these have been issued and their valuable results considered with reference to American conditions. It therefore asks to be continued once more and trusts that it may be for the last time.

THE DISPOSAL OF GARBAGE AND WASTE IN THE HOUSEHOLD.

By Col. W. F. MORSE, New York City.

In considering the matter of the final disposition of garbage, no record of methods can be complete unless there is taken into consideration those means by which the waste of the family is destroyed in the home where produced.

It has long been the opinion of many sanitarians and executive officers of health boards, that the household disposal of kitchen waste was not only of vast advantage to the city from an economic standpoint, but if it could be done speedily and cleanly, would be a much desired help to the housewife as well. Several attempts were formerly made to carry out these views. Apparatus to receive the garbage were attached in different positions and applied in various ways to stoves, but none seemed to meet with popular favor. For one reason or another they all developed points of weakness which were fatal to their usefulness.

Two years ago at the meeting of this Association in Montreal there was brought to the attention of the members there present, a novel way ot disposing of the house refuse, which at first sight appeared to be free from the objectionable features met with in previous attempts.

This was the utilization of the waste heat from the stove, converting the kitchen waste into charcoal, which could be used afterwards as kindling or fuel.

A better description cannot be given than by quoting from the *Journal of the Association* the words of the gentleman who first brought it to the attention of the Association :

" It consists of a perforated sheet-iron basket, with a tight bottom and a capacity of three or four quarts. It is inserted into an expanded section of the stovepipe, a short distance above the stove, and allows the hot air and smoke to pass on all sides of the basket. It is easily withdrawn from its position and replaced with one hand. It will receive the garbage as it occurs several times a day, and needs to be emptied but once in twenty-four hours. The garbage dries to a charcoal without burning, and becomes an excellent fuel for kindling the fire in the morning. It does not compromise the use of the stove, interfere with the draft, require more fuel, or cause any odors."

Here was a new idea. Of all the many plans brought forward heretofore, none had dealt with the pipe proceeding from the stove. All were connected with the fire box of the stove either through the covering lids or by an attachment at the back or at one end of the fire grates.

A trial of this new idea showed that it was practical, that the waste from the kitchen could be charred by driving off the water, and that the watery vapor did not affect the stove-pipe or the chimney, or give rise to offensive odors. The gases from the burning fuel readily mingled with the watery vapor and rendered it innoxious.

The apparatus was brought to the attention of many progressive and intelligent sanitarians and was as successful in their hands as it was in the hands of the inventor.

In the ordinary and usual course of business methods, the idea was taken up by interested parties and still further developed. New and more durable and efficient forms were made—it was constructed in several sizes and different types to conform to the many styles of stoves and ranges and the varieties of fuel employed: coal, gas (natural or artificial), wood, coke, or oil.

At the present date, after nearly a year's active use, the progress made by the invention indicates that it is to be hereafter recognized as an active factor in the disposal of household waste. It has proved itself adapted to the use of families which may contain the average number of persons, and by the employment of double baskets or trays to contain the garbage, the heat from the largest-sized ranges can be effectually employed, and a proportionate amount of waste produced by larger households can be reduced to charcoal.

For the use of the poorer classes of householders there are simple and inexpensive forms of the invention that can be applied to every form of stove or range, though these are rather garbage burners than a process of carbonization. Thus the various styles and dimensions of these carbonizers allow of their use in the widest way, so that any and all houses can be equipped with an apparatus of this kind.

The utility of such a device will of course be apparent at once. It is a vast saving in expense to the city, inasmuch as any household having this in use has no further need of the garbage can; hence all the cost of collection, transportation, and final disposition by the city or town is done away with. It is also evident that the economical use of the apparatus is due largely to the fact that no extra fuel is necessary; the waste of the house is being turned into charcoal at a time when the household work is carried on, and this is done without interference with the kitchen stove.

If there be no serious objection from a sanitary point of view, (and this is assured by the evidence of some thousands of persons having this apparatus now in use in various parts of the country), then the method of garbage disposal by the use of the surplus heat of the kitchen stove, without offense, at reasonable speed, and with economy both to the householder and to the city generally, is manifestly entitled to the attention of every official where the question of ultimate disposal of the city waste comes up for consideration.

THE DISPOSAL OF WASTE OF INSTITUTIONS.

The logical result of a movement for the household disposal of waste is the extension of this idea to include households of the largest size. When the family numbers hundreds instead of tens, and a proportionately larger amount of waste is produced, its disposition by the kitchen stove becomes impossible. Something with a greater capacity is needed.

To meet this demand there has been devised a portable furnace occupying three square feet of space, with an independent chimney connection, which will destroy the waste in quantities of nearly a barrel at once.

This has a garbage receptacle or retort of cast-iron, cylindrical in form with a cast-iron grate at the bottom. This retort is suspended a few inches above the fire pot in the furnace, and the whole is incased in a jacket of heavy sheet-iron.

In operating, the retort is filled with garbage introduced through the charging door, a moderate fire is started in the fire pot and the process of cremation begins.

A simple arrangement of air jets, automatically actuated by the natural draught of the chimney, exhausts all the smoke and odors of the burning garbage from the retort and carries them down and through the furnace fire so that nothing but the thoroughly purified and odorless gases liberated by combustion can escape into the chimney flue.

It has been found by actual use that the service of such an apparatus as this can destroy a very considerable amount of kitchen waste and a still larger quantity of combustible waste with comparatively small amount of fuel. Such an apparatus is largely in use in hotels, hospitals, and public institutions, and can be made of a capacity to destroy five to seven barrels of kitchen waste per day.

When the amount of garbage becomes excessive, in quantities from one to three tons, accumulated in any institution, it is necessary to bring into service a still larger and more efficient furnace.

The modern hospital, accommodating from 100 to 500 patients and numbering with its attendants a population of 200 to 700, needs to destroy its refuse and waste a thoroughly built brick furnace of a type sanitary and economical in operation. These furnaces, connected with the main chimney of the institution, receive and destroy everything of a worthless nature produced on the premises and are one of the most efficient aids to cleanliness and sanitation it is possible to obtain. There are many examples of these furnaces in the larger hospitals.

The disposal of the waste of the household is one of relative degree. It can be as easily done by a family of five as by a small community of five hundred gathered under one roof, and whatever may be the ultimate solution of the garbage disposal question, cremation on the premises where produced is a means which will always be practised, provided efficient apparatus can be found to perform the operation without nuisance and with economy.

FILTH DEPOSITS WITH REGARD TO PUBLIC HEALTH.

By JOSÉ D. MORALES, M. D., Mexico.

Gentlemen: I have the honor to address this illustrious reunion in representation of the state of Guerrero. Its progressive government has taken the liveliest interest in regard to matters of hygiene, and, above all, in responding to the call which this Association has made. I bring to the discussion a question which very often has preoccupied hygienists, and this is the one which relates to the dangers which those points or spots where there is an accumulation of filth, present to public health—spots which are known among ourselves under the name of "muladares," and these perils should and will disappear when, in obedience to the precepts of hygiene, municipal services are performed throughout all centres of population in conformity with the most elevated exigencies or requirements of science. True it is that in times of epidemics the precepts dictated by the boards of health comprise the destruction of filth which, by the means and on account of their own nature, are almost always the most contaminated products or results, and the most suitable and likely to preserve germs of infection.

As is well known, waste matters constitute what forms filth, and when these useless matters which have been cast off proceed from infected persons, all these matters are more or less dangerous. Among the most probable contaminations, above all should be feared those resulting from dealing with the filth in those houses where there are persons ill with tuberculosis. I call attention to this infection because, as it is caused by a disease which is accustomed to last for years, the patients and even their families become so familiarized with the dangers presented by that disease that they even disregard the physician's orders, emptying with frequency their cast-off matters in the garbage. In a like case, with regard to the danger of infection, is the filth from houses where there are persons ill with zymotic affections. Therefore, the destruction of the products susceptible of preserving the germs of diseases should be a general rule, not alone during an epidemic, but always, as a measure of wise precaution.

The destruction of filth will, perhaps, unfavorably influence the industries or trades which profit by some of the products which may be utilized, for example, the manufacture of paper, because, up to a certain degree, rags would become scarce; but apart from the fact that this product is not indispensable for the manufacture of paper, which may be obtained by recurring directly to fibrous plants, the order to destroy filth would give as a result the creations of means for the obtaining of the truly valuable matter without peril to the hygiene of the persons who deal with hygienic matters of cities. Only in this case would be allowable the separation of what could be made use of,—in an industrial establishment, perfectly well arranged, where this operation should have been made after previous disinfection, or in apparatus which absolutely avoid the dissemination of morbid germs.

Now, proceeding in this manner, the danger presented by filth cannot be compared with the insignificant value of what may be made use of, and, in consequence, the rule which is imposed is, that the filth should be destroyed.

This being proved, what may be the most suitable and economical means? Undoubtedly that offered by the crematory furnace which has just been inaugurated in the city slaughter-house, Mexico City. This furnace may receive for incineration up to ten bullocks; when, after previous examinations, it is evident that the carcasses of these animals are diseased, it has been equally tried for the destruction of filth, which is rapidly incinerized. This furnace has its large side chimney, and comprises three compartments in its interior, placed one above the other. The upper one, in which the temperature is the highest, and which receives the products devoted to incineration, is separated from the intermediate compartment by means of a gridiron, formed of thick tubes of iron with perforations by means of which the outside air penetrates, and by means of which, besides lowering its temperature in order to avoid their melting, the products which are directly in contact with the tubes are burned. The middle compartment receives the fuel, and is so arranged that the fire is made active at both ends, where also the necessary air is allowed to enter so that the combustion may be complete, and the furnace is smokeless and produces no bad smell.

The lower compartment is composed of a spongy bed, with many large iron tubes crossed by the products of combustion, and all interstices are filled with fragments of fractional brick; all the liquid products which may drip from above are there burned, for which a certain amount of air penetrates to this compartment.

The cost of the working of this furnace is twenty-five cents per ton of the products which it destroys, these products being formed by carcasses of animals, filth, and excremental matters; an insignificant cost relative to the benefit derived therefrom, but even this cost may be reduced, should the ashes which may be utilized as manure be attended to.

The generalization of the system to burn the filth and other products suspected of being infected, should be rigidly ordered for the smallest centres of population. The furnace just described is one of the most perfect, but a more elementary one would be sufficient for places of smaller population, provided that filth and other products should undergo in them the action of a temperature sufficiently elevated in order to carbonize all the organic matter, even though the incineration should not take place. This means, when applied to large centres of population, would avoid the formation of the grouping together of unfortunate poor people who go to look for what may be utilized from the filth, these people being frequently attacked by illness which they there contract and which they subsequently disseminate through the city. A regulation relative to these filth gatherers should be therefore adopted to the following precepts:

1. With preference, as a rule, all kinds of filth should be destroyed in a crematory furnace.

2. If an industry be allowed for utilization of the products of filth, it will be the avoidance of the direct handling of the filth by persons before being disinfected, and it will be subjected to a temperature of 115 degrees centigrade.

Such are, gentlemen, the improved methods, which according to my judgment should be sought for the destruction of the germs susceptible of being propagated by filth. If, by the precepts previously announced, some lives are saved which might be prematurely taken from the social mass, these lives although few in number, are worth more than all that may be made use of from the filth, and should these ideas of mine merit the approval of the American Public Health Association, they will assuredly be propagated with success in the name and for the benefit of humanity.

DISCUSSION OF THE PAPERS ON THE DISPOSAL OF GARBAGE.

DR. WILLIAM S. TREMAINE.—Those of you who have already driven about our beautiful city, or may do so during this week, perhaps have noticed that our resident district is exceptionally beautiful in the absence of fences around front yards, and that the beautiful lawns are kept with flowers. I was driving down day before yesterday morning from my residence, and along the beautiful lawns stood reeking, festering barrels, containing decomposing garbage. I regret this extremely, and more so on account of the visit to our city of distinguished guests. I struck one garbage wagon in front of my vehicle, and I do not think I have got the smell out of my nostrils yet. I am sure that our distinguished health commissioner does all he can to prevent this, and it is a great error. The removal and disposal of garbage should be under the direction of the health department.

It has been advocated by the preceding papers, and does not need discussion, that it is possible to destroy the household waste and refuse, and this must be done, first, from an economic point of view; secondly, from an aesthetic aspect; and lastly, but most important, in its sanitary point of view. That this can be accomplished in a degree by the ordinary furnace, when lighted during the winter, of course we all know. In this city, provided as we are by natural gas, which is used in the furnaces and kitchen stoves, this method is impracticable. Of course, in the summer season, it is also more or less impracticable. With many of the appliances that are used, connected with kitchen stoves, they insist on fire being kept up continuously. In this city, where natural gas is used extensively, these methods are not as practical as where that condition exists.

Some three months ago, an apparatus was brought to my attention which has been exhibited to you in model form. When Dr. Wende suggested that I read a paper before this Association, in collecting information with regard to the subject, this apparatus was brought to my attention. It is the invention of a gentleman in this city. He has used it himself in his own factory for two or three years past. At first, I was skeptical as to its merits. I have made patient investigation for two or three months, and I know it will accomplish the purpose of disposing of garbage economically and without odor. I mean, during the time when the garbage is collected in it for a week at a time, there is no odor to be detected, no matter how much decomposition may be going on, and during the cremation, which is done by a small amount of fuel in half an hour, there is no odor. Furthermore, this apparatus was used in a very effectual way. Seven or eight men sat in a room half the size of this, with a screen around in the place of the water-closet. One of them preferred this apparatus, after building a house, instead of a freshet closet. With other appliances there were odors, while with this there were not. I satisfied myself that the statement was correct. When this apparatus is connected with a chimney, and there is a good draft, odor is impossible. You cannot detect the slightest odor of excrement or urine. When the fire is lighted, and during the process of drying out and cremation, no odor is discernible. This is a strong statement to make, but it is absolutely true, and a practical test will demonstrate it to you. There may be other appliances which will accomplish the same purpose that this apparatus does, with which I am not familiar.

There is another use for this apparatus. In many of the smaller villages and towns and seaside resorts, an ordinary water-closet is impracticable. This apparatus would fill a great want in such places as railway stations, in military posts. To medical officers of the army it has been a constant annoyance how to take care of the excrement of the ordinary garrison.

I am down on the programme to read a paper on the "Disposal of Household Garbage and Excrement by Cremation." My paper was to embody the principle of destroying the refuse and excreta of human beings at the places where it is created, to avoid the dangers to the community by transporting them, and avoiding the nuisance to their olfactories in being carted through the streets. There is nothing more I have to say, as I think the ground has been covered by the other paper, and this apparatus, to which I have briefly referred, has been already explained to you. The apparatus I care nothing about, but it seems to me that here is an appliance which supplies a long-felt want, and practically solves the problem of the disposal of garbage. As I have previously said, other appliances may do the same thing.

Dr. Albert L. Gihon.—There is one point I should like to bring out, prior to those who may speak directly upon this subject, as well as of the apparatus that has been exhibited. Assuming that there are from eight hundred to one thousand pounds of garbage destroyed, I think we have a means of disposing of one half of it, and my suggestion is to eat it. I will give you the experience of a friend of mine, who commenced housekeeping in France. His cook discovered the eating capacity of his family, and what little waste was made was burned. My friend subsequently came to the United States, went to Boston, and commenced housekeeping there. The first institution was a swill pail, and in that pail was placed food that he would have eaten with pleasure a year before. Now his household expenses are doubled. My suggestion is that this Association should in some way instruct the public that they had better eat the greater part of that which they throw away. When my wife and I commenced housekeeping in New York city, in the course of six months she had battles with six different cooks, in endeavoring to carry out this thing. In the case of one cook, I effected a revolution by diminishing the size of my garbage can, which is a good size, and I warned her not to waste food to exceed the size of that can. In this way, I have succeeded in saving some of the vegetables. Now, if the Association impressed upon the public that they had better eat the larger portion of that which is called kitchen waste, they would accomplish an economic, as well as a sanitary, purpose.

Dr. George M. Sternberg.—I have but a word or two to say on this subject, and it is in the direction of what has been proposed, that is, an argument in favor of disposing of garbage at once, and in the house, as it seems to me practicable, and I call attention to the fact that while bad odors from the swill pail alone will make people sick, perhaps these odors have a useful purpose in keeping us as far away as possible from such receptacles. There is a way by which the contents of the filthy receptacle may be brought to your table, and that is by the persistent house-fly, which I believe does a good deal of damage in various ways. In the first place, when there is really no infectious material in your garbage pan, or in the shallow privy of a country place, if the excreta of a typhoid patient have been thrown into the privy, there may be no possible way for contamination of the well or the water-supply, and it may be a little mysterious how other cases of typhoid occur, but we know how flies congregate about such material, and we know that when a bacteriologist touches his culture with the end of a platinum needle, he carries millions of bacteria to the new culture. So the flies, on their proboscis, carry away from these filthy places this material, go to the kitchen, fall in the milk jug, light on beefsteak, etc., and many of the mysterious cases of diphtheria and typhoid fever and so on, are due to the direct contamination of food by this means.

The few cases of cholera which occurred in New York city, during the introduction of cholera from Europe and Hamburg, happened in a similar way. A few cases occurred in the lower bay, and others in various parts of the city. While it was impossible to demonstrate the connection, there was some reason for believing that that might have been the way in which the cases originated; that the butchers, who went to the shippers with their meat, brought back some flies to the butcher-shop, and certain girls who fell sick in New York, and had not been near any ship, may have contracted the disease from the beefsteak in that way before it was cooked. I wish to dwell on that possibility, as I think it is of the greatest importance.

DR. EDWIN CLARK.—There is good horse sense in what our friend, Dr. Gihon, has said. I desire to emphasize the fact that the American people to-day are cooking a great deal more food than they can possibly eat. It is necessary for this Association to educate people not to cook more food than they absolutely need, but the fact is, the American people are a wasteful people, and hence we have a constant accumulation of garbage and refuse in every household in the land.

So far as the disposal of garbage is concerned, I have been an advocate of the method by reduction. Many of you know that I served on the Committee on the Disposal of Garbage and Refuse in this Association for about three years, and for seven or eight years I have paid considerable attention to this subject; I have written several papers on the subject, and the question of the disposal of garbage in the household is a very important one, and this Association must take a decided stand, sooner or later, in order to accomplish good results.

So much ground has been covered in the papers read, that it is almost needless for me to say anything. The necessity exists for some apparatus or device by which garbage and refuse can be destroyed in the household at a nominal expense. My attention was recently called to the invention which Dr. Wordin alludes to, that is, the apparatus he exhibited and described, and the one to which Dr. Tremaine also directed attention. I understand that this apparatus is now in practical use in this city. I received word this morning from the gentleman who has the matter in charge that a practical exhibition of the apparatus will be given at 2:30 today. You can hardly believe, until you see the apparatus, what results it will accomplish. I was perfectly skeptical as to what this apparatus could do until I saw it in operation. It will dispose of human excrement in a short time without any odor, and when I was told this by the gentleman I simply laughed at him because I have seen many crematories and have never seen one yet that did not emit more or less odor. But I was astonished at the results in this case. To those of you who are interested in this subject, I hope before you leave the city you will see a practical exhibition of this method of disposing of garbage. I am simply interested in it as a sanitarian, and know nothing of the financial side of the business. I do not know the man who has invented it. I agree with Dr. Tremaine that if this apparatus were used in country places, summer resorts, military posts, etc., a great many visitations of typhoid fever and other intestinal diseases might be avoided.

Dr. Benjamin Lee.—There is in operation in one of the smaller cities of Pennsylvania what is known as the domestic cremation of garbage, and it is practised to a very considerable extent. We have with us a representative of that city—Dr. Varian,—President of the Board of Health of Titusville, and I think the Association will be glad to have the experience of that gentleman.

Dr. Wm. Varian.—In our city of ten thousand inhabitants we are peculiarly situated, in that we have no fuel except natural gas. It has been asserted here that Buffalo could not dispose of its household garbage by individual cremation because natural gas formed so large a feature of its fuel. We find with us that it is the best of all means for consuming household garbage—that, too, almost without any apparatus. It is true that some of our citizens have individual small furnaces prepared for the disposal of their household garbage, but the majority of the community from the poorest to the richest dispose of their garbage entirely with ordinary kitchen stoves, simply being careful to exclude, as far as possible, fats from the refuse so as to avoid oily smoke, as they have no means of passing the gases during cremation a second time through the fuel. The simplest and easiest way, as every mechanic in Titusville will tell you, is to spread garbage refuse of every description, bones and everything else, between the top plate of the ordinary kitchen stove and the oven top and cook with your fuel, and in a short time with the intense heat obtained from the natural gas, the chimney being open, you have no garbage left. It is a mere charred mass. This method is practical, it is cheap, and simply because it is cheap it can be used by every individual member of the community. They all have to have fire, they all have to consume their garbage, not only in the winter time when fires are constant, but at all seasons of the year. It takes but little attention on part of the housekeeper or servant in charge of the kitchen to attend to this matter, and there is little or no further disturbance.

The apparatus exhibited and described here today is, of course, an ingenious one for disposing of human excrement, etc. I have no doubt that it can be used for other purposes, but it is beyond the reach of all except a certain class of the community. This is the practical point, and we have to look at it—the accumulation and disposal of garbage among the poor. Something should be devised and brought within their reach to dispose of it. We must have something that is cheap and adapted to the wants of the majority of people, because the rich and more highly educated people will take special pains to secure an apparatus which will meet their wants.

Dr. E. H. Carter.—I have only had experience with one kitchen stove, and I find that after disposing of the fluid portion of the kitchen garbage it can be readily burnt in the regular fire box of the stove. It is not allowed to accumulate and remain, but the kitchen waste in my house is burnt every day, or twice a day. The small quantity which accumulates in a short time is easily consumed in the fire box. I am sure twice the amount could be consumed in our stove, if necessary, without any injury whatever. It adds a little to the fuel in many cases, especially bones, vegetables, and pieces of bread, but after draining off the fluid portion of the waste it can be easily consumed.

Dr. Henry Mitchell.—I think, Mr. Chairman, that this Association ought not to go on record as commending any system of retention of excrement on premises. One of the papers spoke of retaining and cremating excrement on school premises. I believe it is the almost universal experience among those who have witnessed or supervised this work, that it is a failure, and it seems to me one of the unfortunate risks and dangers which this Association is liable to is, that we mislead the public, and it is only for that purpose that I draw attention to this fact. The retention of excrement on school premises is wrong in principle; that thus far in our efforts to dispose of excrement in this way it has been a failure, and numerous instances are on record where it has proved a source of danger. It has been shown to have produced typhoid fever in several instances.

Dr. Samuel H. Durgin.—It seems to me that all of the reports and papers upon this subject which have been read before this association in the last few years—and we have had many of them—force us to one legitimate conclusion, and that is, the waste material in our large cities, which is enormous, should be divided into two parts. First, the general refuse, including the garbage which is collected all over the city, from within the household and without, and that which is collected by the city constitutes one part. That which is found in the household constitutes another, separate and distinct part, and is the worst part we have to deal with as sanitarians. It seems to me, that from all the information which we have gathered from this subject we are driven to feel that this refuse material, this decomposing substance, must go through fire in order to be purified and to have the resulting material used for filling or other purposes upon the land. Up to a comparatively recent date it has been the cause of great mischief in all of our large cities and other places by being used for filling lands upon which dwellings or business buildings have been erected. Furnaces and plants for the reduction of this matter should be situated in convenient parts of the city and within the city, and we all know they may be so situated and operated without offense to the business or residential parts of the city. I believe that to have been perfectly demonstrated. In this way we give a short haul for the contractor, or for the city, as the case may be, and it brings the plants and material within short range, and there will be less liability to dispose of garbage or material surreptitiously into vacant lots and ponds of water. By doing this the cost to the city will be materially reduced. Carrying garbage and refuse into rivers and upon lands is too clumsy, expensive, and is not a credit to this age of our progress in sanitary science, and when we as sanitarians find that this clumsy means is adopted by some of our cities, it seems to me to be a waste of time.

Now, for the other part of the material,—the household garbage. It has been demonstrated beyond any question that not only does it belong to the household to dispose of its material, but it is the only sensible and sanitary method that should be pursued. To ask a municipality to go to our houses and take away this refuse is an imposition. Left upon our premises until it is decomposed and made a nuisance to ourselves and neighbors is another imposition which no man has a right to perpetuate. If he does it upon himself, he has no right to impose it upon his neighbor. Therefore, I am totally and thoroughly disgusted with the idea of garbage being dumped upon any part of my premises or those of my neighbors. (Applause.)

Dr. Lucien Howe.—The discussion has already continued at such length that I hesitate to add even a word. However, I desire to touch on one or two points briefly. One is *apropos* of Dr. Sternberg's remarks in regard to the propagation of diseases by flies. The doctor knows infinitely better than I do as to the progress that has been made in this direction. In a small way it occurred to me to study that subject, and it can be studied by any one, and I venture to occupy a moment to call your attention to the simplicity with which that fact can be demonstrated. It occurred to me to inquire as to the transmission of certain forms of bacterial products, or the bacteria themselves, especially with reference to purulent ophthalmia, and it was in connection with a committee that led me to investigate this matter. We spent some time in the laboratory of Dr. Alexander, and nothing was more thoroughly impressed upon my mind than the manner in which certain forms of bacteria were transmitted. Take an ordinary culture plate, take a fly and put a pin between the wings, let the fly touch a little pus and walk over the plate, for the time being you will see nothing. Then put it into the oven of an incubator and in 24 hours you will see little spots. A little later, say 36 hours or more, these spots are advanced. They become larger, and still later the fly will be found to have implanted its feet on the gelatine plate. In this way you get beautiful cultures. It is a simple method of demonstration, the details of which I shall not go into at this time. If any of you will take the pains to look over the Transactions of the Heidelberg Congress for 1888, you will find this method given in detail. The whole plan is so simple that I thought it was worth while to say a word in regard to it. A few words now in regard to the drift of the discussion. That we have a practical method in the apparatus exhibited for the disposal of garbage, there is no question. I have examined it with some special interest, and I am glad to know that there is another way by which natural gas can be used. Until recently it was said to be impossible, and as we have so many furnaces in Buffalo, just as soon as the oil is placed in the oven we have difficulty. I hope that has been overcome.

In regard to the disposal of garbage, we know that it is allowed to accumulate in some places until it not only becomes a nuisance to ourselves but to our neighbors, and no matter how much we may preach about it, proper methods for its disposal are not adopted. In certain houses and districts it might do to use an apparatus for disposing of garbage, but the average man will say, "I do n't care about that. It costs me five dollars, and I have no money to purchase it now." It strikes me the point is here: If we make the people pay five or ten cents every time the garbage barrel is collected, they would soon find it pays to have an apparatus to dispose of their own household garbage, and I believe it is only along this line that we can accomplish what we desire. If we have gas and electric light, we must pay for them, and why should not the people be educated to pay for apparatus to dispose of their household garbage? This matter needs local legislation, and only that will accomplish it.

Dr. Lewis, New York.—I wish to say a word or two in regard to the disposal of garbage in our cities, which I regard as one of the most important matters that can come before the Association. Instead of carting garbage, as is now done, I think it would be a better plan to have established, throughout the length of a city, small stations, say every few blocks, for the reception of such material.

One word more in regard to the apparatus which has been exhibited. There can be no question as to the utility of this apparatus as well as others, but necessity has taught me within the last six years that we may do everything without apparatus. For example, in the twenty-fourth ward I find that the garbage carts only come once a week. We have no difficulty whatever with garbage. A little pan holds the garbage every morning, such as the vegetable scraps, and what meat is cooked and not eaten goes to the poultry yard, other things to the horses, while the bones are burnt in the fire, and at the end of a week we have nothing left of garbage in our house except tin cans and bottles.

Col. William F. Morse.—I have very little to say in closing my part of the discussion. In furtherance of the paper which I presented, I desire to say that any apparatus which is introduced into the household for the disposal of waste must be sanitary. It must totally destroy the waste, otherwise it falls to the ground. Garbage with grease, when thrown into the ordinary kitchen stove and burnt, emits an oily smoke, which is decidedly objectionable to your neighbors. Suppose only a block away there are from fifty to sixty houses, and the cook of each house stuck the garbage in the stove, what would be the result? It would be not only a source of great annoyance, but a nuisance. The object of all inventions of this kind should be to devise an apparatus to avoid that nuisance. We are now discussing the practical side of this matter. We all know that we can burn garbage in our kitchen stoves, but can we do it without more or less annoyance to our neighbors? We need an apparatus in the household for the use of the poor as well as the rich, adapted to every stove and range. It must be constructed for every class of fuel, such as gas, artificial and natural, coke, wood, etc., otherwise it will be a failure.

I am told there is a portable apparatus in the basement of this building which is capable of destroying seven or eight barrels of garbage each day. Here is an object lesson for us, and I hope the members will examine it at their leisure.

Dr. A. N. Bell.—At the risk of repeating a suggestion which may have already been thrown out without my hearing it, it has occurred to me that this apparatus is one which appeals to the municipalities, to the government, to the expenditures of our cities throughout this country. I believe, that with the endorsement it ought to have by this Association, it will commend itself to municipal authorities as a means of disposing of garbage at public expense which is produced in their own houses. It is clear to my mind, from a good deal of practice and observation, that while I have, during more than forty years of housekeeping, excluded the garbage man and fat man from my doors,—that while I have had the domestic garbage burnt in an ordinary cook stove, etc.,—I see that this is a great improvement, and with the facilities now before us, we have a strong incentive to invite the public to coöperate with us in the promotion of sanitation in one particular sphere, which is not second to any that has ever come before this Association.

Dr. William S. Tremaine.—The point I made, judging from the trend of the discussion, seems to be lost sight of. One gentleman condemned the method of retaining excrement about any premises. I would like to ask how it is possible to avoid that under existing conditions, except where there are sewers and freshet closets? In all country villages and towns the privy is usually in the back yard, and the dangers to human life are great. We want to do away with them. Assuming there is a case of typhoid fever in a family, by having the stools placed in a receptacle and immediately burned the danger of transmitting the disease to other members of the family by the excreta is avoided. That is one of the points I endeavored to make. If there is an apparatus that will do that, then it is an advantage.

If I had time, I could relate a unique experience which would demonstrate the transmission of typhoid fever in a rather unusual way, where the disease was brought and transmitted from a privy of a hotel to the well, and then transmitted to the surrounding inhabitants, but that would take up too much of your time. I am fully alive to the dangers of transmission of disease in this way, and it is one of the things I wish to avoid by immediate destruction by the only agent that can destroy—heat.

As regards the cost of an apparatus of this kind, it is an objection, but that objection applies equally as well to any plumbing system, and any plumbing system is much more expensive than any apparatus that has been suggested here. These things are enforced by municipal regulation, and if sanitary authorities determine that a method of this kind is not only very practical but extremely useful, it can be enforced by municipal authority.

DR. N. E. WORDIN.—The Association listened to my paper, and I feel that I ought not to say any more, but there are objections to attempting to burn garbage in a kitchen stove, whether on the fire box or on the lids, as it interferes with the pipe. It clogs the chimney, it is offensive to neighbors, and it cannot be done without creating a nuisance to those outside. A plan, to be successful, must be universally adopted. We are the servants of those who serve us, and unless we can get domestics, and those who work for us in the kitchen, to adopt this method, it will not work well. The appliance exhibited this morning is one such as I think would be adopted by servants, but it must be not only in the families of the wealthy but of the poor. We cannot feed garbage to horses, because we do not all have horses. I think the device shown is capable of being adopted by them.

MR. RUDOLPH HERING.—I do not know that I have anything particular to say in closing, as a member of the committee, excepting that I might refer briefly to the subject of the disposal of garbage at the house, which is a question that was not embodied in the circular sent out, and which it was not the intention of the committee to report upon, excepting incidentally. I may say personally, that it goes without saying that the destruction of garbage at the house, if it can be done with a proper method, is by far the best way of treating it. But, unfortunately, it is practically impossible to get everybody in a city to resort to this method. It is almost impossible to use it in some cities where coal is not used, where the cooking is done by gas or oil, except under certain conditions, which it is not well to force upon a community. It is, therefore, absolutely necessary that there should be public collection and disposal of a large quantity of this refuse, whether or not the garbage is destroyed by the individuals on their own premises. Therefore I think the two subjects must be considered, if possible, to do away with the public collection and disposal of garbage.

REPORT OF THE COMMITTEE ON NOMENCLATURE OF DISEASES AND FORMS OF STATISTICS.

Your committee respectfully submits the following report:

REPORT.

The chief topic for consideration before the committee at the present time is the need of a uniform system of classification and nomenclature.

The system proposed by Dr. Bertillon, of Paris, and presented by him at the International Statistical Institute at Chicago in 1893, was published in Vol. XX of the Transactions of this Association, page 521. Since that time the revision of what may be termed the English system has peen published by the Royal College of Physicians.[1] The basis of this system is anatomical in its character, and the diseases are mainly classified in accordance with their anatomical distribution.

An examination of the following memorandum of this committee on classification, shows that no very radical changes have been attempted. It is, in fact, desirable that such changes as are made shall not make it difficult to compare "new things with old," or, in other words, to make it impossible to compare the course of any one disease or group of diseases in their incidence upon a given population with that which prevailed under a previous system of nomenclature. Consideration of the broad and general groupings of different diseases is of much less sanitary importance than the direct study of single diseases without special regard to their general relation to each other.

The following extract from the preface to the revision of the British system of nomenclature shows the principal changes which have been made in the present decennial revision:

The general plan of the nomenclature remains the same as in the last edition, but some considerable changes have been introduced.

GENERAL DISEASES.

For the section called in the last edition "Diseases of the whole body and diseases which may be distributed in several parts at one time," the term formerly used, and indicated in the last edition "General Diseases," has been restored. This division, however, includes not only diseases properly so called, but morbid conditions affecting either the whole body or more than one part.

After careful consideration, it has been decided to omit the division into groups employed in the former edition, on the ground that accuracy of nomenclature rather than pathological classification is the object of this work.

The disease called in the last edition "Epidemic Rose Rash," is now in deference to the views of physicians specially conversant with the diseases of children, called rubella, other names being admitted as synonyms.

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[1] A nomenclature of diseases drawn up by a joint committee appointed by the Royal College of Physicians of London, third edition, London, 1896.

In consequence, more especially of representations made by officers of the medical department of the army, Mediterranean or Malta fever has been admitted as a distinct disease.

Other new names in this division are tetanus (as a general disease), actinomycosis, foot and mouth disease, pellagra, Hodgkin's disease and diabetes insipidus.

Horse pox, parangi, and glycosuria are omitted from the list of general diseases.

The term anthrax is now employed only for the disease called in the last edition splenic fever, and is no longer used in the sense of carbuncle.

LOCAL DISEASES.

In this division every part of the nomenclature has been subjected to the more careful revision, and numerous changes of detail have been introduced. In some sections more considerable alterations have been made.

The section of diseases of the nervous system has been entirely recast, and arranged mainly on an anatomical basis. Separate subsections have, however, been retained for functional diseases (including those of which the anatomical seat is uncertain) and for mental diseases.

The sections of diseases of the larynx, diseases of the digestive system, and diseases of the skin, have received important additions.

The section of poisons has been removed to the appendix, as referring rather to the causes of disease than to the actual diseases.

APPENDIX.

The section on surgical operations has been entirely rearranged, and has undergone considerable alteration.

The section on malformations has been entirely rewritten.

The enumeration of tumors and morbid growths has undergone equally fundamental alteration, in order to bring it into harmony with modern classification. The class cyst has been retained in deference to usage and needs of registration, though it necessarily overlaps some of the other divisions of the nomenclature.

The section of animal parasites has been carefully revised with a view to more accurate zoölogical classification, and greater importance has been assigned to parasitic protozoa.

The section of vegetable parasites has been enlarged, and the portion relating to bacteria is entirely new. In this part it has not been attempted to give a complete enumeration of all the known varieties of parasitic bacteria, but only to mention the more important forms, both saprophytic and pathogenic; and it has been thought better to err, if at all, on the side of omission rather than to include forms of which the specific distinctness or the significance is still doubtful.

For the purpose of furthering the progress of scientific investigations as to the causes and prevention of disease, there is no more important aid than a thorough and progressive system of nomenclature, which shall be uniform in its character or as nearly uniform as differences of race and climate will admit, and which shall be in harmony with the accepted teachings of the foremost medical and sanitary authorities. There should not only be published a full and complete classification after the plan of the Royal College of Physicians, but also a condensed and practical system, which shall be adapted to the constant daily use of officers of health and registration officers engaged in active work.

It is for this reason, therefore, that before advising the general acceptance of any one method or system for general use, your committee would recommend that this Association shall collect and compare the systems now in use and employed by the different national, state, and municipal authorities in the country, that these may also be compared with the systems in use in other countries, and that a general system shall be recommended by the committee, for adoption throughout the states and countries within the bounds of this Association.

SPECIAL TOPICS.

The following special topics have been contributed by members of the committee, and by the president of the Association—Dr. Licéaga. The following is contributed by Dr. Licéaga :

I. Nomenclature of the causes of death in use by the superior board of health of Mexico until December 31, 1895.

II. The Bertillon system now in use by the superior board of health of Mexico since January 1, 1896.

A paper by Dr. Monjaras, of San Luis Potosi, on "The Necessity of Uniformity in the Meaning of the Term Still-Births."

The subject is one of considerable importance and deserves careful attention, since the municipal authorities differ considerably in their methods of treating the subject. Still-births should form a statistical class by themselves since the statistics of this class form an important index for several purposes. When taken with living births, the two groups together furnish valuable information as to the actual fruitfulness of the population, a subject which has been very fully treated by Dr. Wilbur in the last Registration report of Michigan. When the general or crude birth rates are considered as well as general death rates, still-births should be omitted, since as *still-births* they add nothing to, and hence as *deaths* they subtract nothing from, the living population.

The deaths in public institutions of persons coming from other municipalities should not be included in the estimation of the death rate of the municipality in which the public institution is located, but only in the general death rate of the state or province.

Where the population of the state is large or densely settled, and the public institutions are numerous, a separate report of hospitals and other institutions may well be appended to the general mortality reports of the population.

Two other questions are suggested for the consideration of the committee.

1. The length of time necessary to constitute a residence.

2. What constitutes the *nationality* of an individual?

The time has fully come when this Association should take definite measures toward securing uniformity in the different departments of statistical work; at least so far as those authorities living within the boundaries of the Association are concerned, since this organization more than any other, composed as it is of sanitary and medical authorities, is most directly interested in the subject of vital statistics, and very much of its legitimate work is founded directly upon the results obtained by the individual observers from whom all collections of vital statistics must necessarily be derived. Such measures as the Association can take must first necessarily depend upon actual study and observation of the methods now existing and in use, and then further work can be done in the direction of correcting errors, and in reforming methods which are not only out of date, but at variance with existing medical knowledge.

NECESSITY OF UNIFORMITY IN THE MEANING OF THE TERM STILL-BIRTH.

BY DR. J. E. MONJARAS, HEALTH OFFICER OF SAN LUIS POTOSI, MEXICO.

For every 1,000 births (dead births included) how many are still-born? This is a question of statistics that cannot be decided in a satisfactory manner, and in the dynamics of statistics the solution is important or essential.

It is impossible to solve this because experts have not yet agreed among themselves upon the true definition of still-births "mort-nes."

In France, Belgium, and the Netherlands, according to J. Bertillon, every child who has died before being inscribed in the registry of birth, is classed as still-born.

In Italy, the law styles as "dead birth," all children dead before inscription in the registry, but the statistics include as "dead births" only those who have not breathed.

In Roumania, only those are inscribed as "dead birth" who have come into the world without life, with at least six months of intra-uterine life, as those of less duration are considered as abortions.

In Switzerland, the federal law styles as "still-births" those who have died before birth and without having breathed.

In Germany and Prussia, an imperial law of February 6, 1875, styles as "still-birth" those who are born without life, and have died during labor.

In Bavaria, the royal statistics state that the Catholic priest frequently baptizes children who die, or who, it is presumed, have died during labor, and these children are not considered as "still-born." This accounts for a difference in mortality between the Catholics and Protestants so far as still-births are concerned.

In Saxony and Baden, children who have died before having breathed are classed as "still-born."

In Austria the proportion of "still-births" is extraordinarily small. This is probably due to the fact that the registry is in the care of the clergy.

In Sweden and Norway, "still-births" are those who have died before or during labor, and without having breathed. The same is true of Finland.

In Denmark, "still-birth" is understood to be a fetus of at least six and a half months, that has come into the world without having breathed; if the newly-born child lives a few minutes or hours, it is considered as a child that has died before twenty-four hours, and is not classed among the "still-births."

In England, Scotland, and Ireland, "still-births" are not taken into account.

Now, therefore, as the great value of statistics lies in comparison, they have a much greater interest when compared with those of previous times, or with similar statistics of other countries, but it is impossible to make this comparison until the countries agree among themselves as to what is meant by "still-births."

I propose, therefore, the following:

1. That it should be understood that "still-births" are those of more than six months of intra-uterine life that are born dead (definition of Denmark).

2. That there be added to the nomenclature of causes of death, a term that shall represent those children who died within seventy-two hours after birth without known cause, designating these by the phrase "died at birth without known cause."

3. That the Committee on Nomenclature of Diseases, Causes of Death, and Forms of Statistics, should be entrusted with the carrying out of this modification in the nomenclatures that exist in the countries of the American continent.

4. That as soon as they are accepted in this continent efforts should be made to have them adopted also in Europe.

Abstract of letter of Dr. E. Licéaga, relative to the nomenclature of diseases employed in Mexico:

From the year 1888, the president of the board proposed the adoption of the provisional nomenclature adopted by the Royal College of Physicians, of London, and which have also been adopted by the government of the United States of America.[1]

This nomenclature was adopted at that time, because it was the one then followed by almost all the English speaking nations, and in order that our tables of mortality might be compared with those of such nations. My annex No. 2, is prepared in accordance with that nomenclature which was employed from 1888 up to December 31, 1895.

In the meeting of the American Public Health Association of 1893, the general inspector of public health of the state of San Luis Potosi, Mexico, Dr. Jesus E. Monjarás, presented a motion for the approval on the part of that association, of the nomenclature which had been proposed by Dr. Jacque Bertillon, and which had already been accepted by the International Institute of Statistics. This proposition was accepted by the Canadian delegates, and is now employed by the Quebec Board of Health.

In the meeting which was held the following year in Montreal, Canada, the Committee on the subject, also on motion presented by Dr. Monjarás, passed a resolution that the Association should propose to the different governments, the adoption of the Bertillon nomenclature.

In the second Mexican medical congress, Dr. Monjarás announced that this nomenclature had been adopted by the state of San Luis Potosi, and he proposed that the same action should be taken by the Supreme Board of Health in the Republic, and by the other states of the same. The board had the proposal of Dr. Monjarás under consideration, when Dr. Bertillon, of Paris, himself and the Quebec Board of Health, addressed themselves to the Mexican corporation, begging that it would adopt that nomenclature which was already in use in the greater part of the European nations.

I must add that the general inspection of public health for the state of San Luis Potosi, has been the pioneer in this action, as regards the Mexican republic.

The modifications which the Mexican board of health introduced in the Bertillon nomenclature, are slight; but they require a little explanation: The group which pertains to suicide, cannot appear under that nomenclature, because this cause of death cannot be stated by the civil registry, seeing, that according to Mexican legislation, only the judicial authorities can decide whether a violent death has been caused by accident, suicide, or homicide.

The Quebec board of health formed a group of deaths caused by *Uremia*, this word does not indicate any disease, but a *clinical syndroma;* but so great is its importance, that even the text-books of pathology dedicate a separate article to the subject, and the certificates of death are very often found giving this disease as the sole cause of death.

The board of health has added another and final heading to the nomenclature, which covers abortions and still-births, as, although persons who have *not been born* really ought not to figure in the tables of mortality, we cannot ignore the utility to public hygiene of the statistics of abortions and still-births.

The two systems of nomenclature referred to in the foregoing letter of Dr. Licéaga are omitted, since the use of the first has been discontinued, and the second (that of Dr. Bertillon) has already been published in the 20th volume of the Transactions of this Association.

DISCUSSION OF THE REPORT ON NOMENCLATURE AND FORMS OF STATISTICS.

Dr. Lindsley.—I rise, Mr. President, to express my high appreciation of the importance and value of the papers which have been read. I think the importance of this subject is constantly increasing. There are still a number of states in this country that do not take an active part in securing vital statistics of their communities, but they are diminishing; that is to say, there are more states undertaking the work now than formerly, and it seems to me it should be undertaken on some common basis. The value of vital statistics depends upon two factors. First, their accuracy, and second, their numbers. The vital statistics of a small village of five or six hundred people would not settle any question of science, but the vital statistics of a larger community, of a large city or several cities or states, would increase their value in proportion to their members and in proportion to their accuracy, and inasmuch as we may reasonably expect that in the future more and more states of this country will take up this work, it is of the utmost importance that it should be done on a good basis. It seems to me that this Association should provide some means for studying the various systems that are in use in various countries, and from them all compile some common system which will be adapted to the wants of our communities in this country. This is important work now before the Association, and I hope some good will be done in this direction.

REPORT OF THE COMMITTEE ON TRANSPORTATION AND DISPOSAL OF THE DEAD.

The Committee on Disposal and Transportation of the Dead would respectfully report as follows:

The committee has nothing to add at this time, as regards disposal of the dead, to what was reported at the last meeting.

The *transportation* of the dead is, in the opinion of the committee, of much greater practical importance. In 1889, the National Association of General Baggage Agents, through a committee, sent to all state and municipal boards of health, a draft of proposed regulations governing the transportation of dead bodies. Suggestions as to necessary changes in these regulations were invited. The Association finally adopted a set of rules and regulations, and requested the various state boards of health and railway companies to make them their own. A considerable number did so. These rules were intended mainly to protect railway employees, but gave, at the same time, greater or less protection to the general public.

In brief, they prohibited the transportation of the bodies of those dying of small pox, yellow fever, leprosy, Asiatic cholera, typhus fever, and diphtheria. Diphtheria was not at first included, but several of the state boards of health amended their rules so as to prohibit transportation where death resulted from diphtheria, and later the General Baggage Agents association did likewise.

Of the other contagious diseases, scarlet fever, measles, typhoid fever, puerperal fever, anthrax, and erysipelas, are in the list where transportation is permitted, provided the body is enclosed in a hermetically sealed (soldered) metal coffin or case.

Many of the state boards of health did not adopt these regulations, and great confusion and many complications have arisen because of conflicting rules. For instance, the body of a child dying of diphtheria in Massachusetts may be stopped at the line of Ohio, Iowa, or some of the other states prohibiting the transportation of such bodies. A great evil as well as danger has grown out of this prohibitory rule as to diphtheria. Where a child is taken with the disease away from home every inducement will be offered to get the attending physician to certify to some other cause of death. Considering that the diagnosis of diphtheria often requires a bacteriological examination, it is exceedingly easy for a pliant physician to escape both moral and legal responsibility. He may readily say, to himself as well as to the public, I did not know it was diphtheria. Cases of this kind have more than once actually occurred. If tonsilitis or some other non-contagious disease is certified, then no precautions whatever are taken.

Your committee is of the opinion that it is quite possible to so prepare a body dead of infectious disease with promptitude and but little expense, as to make it transportable without any danger of transmitting infection; and that it is the duty of this Association to develop the simplest methods by which this desirable end can be attained, in order that the sentiment of report for the dead may be maintained without any danger to the living.

If, however, all dead bodies are to be allowed transportation, it would be necessary, we think, to provide that the preparation of bodies, where death resulted from a contagious disease, shall in each instance be under the direct supervision of the health authorities. To insure that such bodies will not be exposed at the place of destination, it will be necessary to have the health officials of that place informed in advance of its expected arrival, so they can take charge of it. The friends who accompany a body dead of infectious disease are often more dangerous to the public than the corpse, and should be controlled by the health authorities.

(Signed) C. O. Probst, *Chairman.*
P. H. Bryce.
Charles N. Hewitt.

DISCUSSION ON TRANSPORTATION AND DISPOSAL OF THE DEAD.

DR. SAMUEL H. DURGIN.—I presume there is no executive officer of any health department within our territory who has not had more or less trouble and bother in the proper disposal and transportation of dead bodies. It is not a gracious or kind act on the part of any health officer to deprive a family which has lost some loved one of a slight delay in the exercises which commonly follow death. It is also a great hardship to drive these people into measures which they cannot afford to carry out. With this feeling in view, for the last few years I have endeavored to encourage undertakers and manufacturers of caskets to find some cheap but effective material for the encasement of dead bodies, and in which they might safely be transported, and yet come within the means of the poorer class of people. It is well known that boards of health find it necessary in the creation and enforcement of health regulations to bear in mind the poverty of certain members of society. Therefore there have been made efforts in my own section to find some casket which would be cheap, yet effectual for this purpose. Two years ago I was called to see a miniature casket made of sheet steel. I will pass over the observations which I made at that time, and say that within a few weeks I have been called by the same party, who is an ingenious mechanic, to see him place in position a six-foot coffin made of galvanized sheet steel. In the lid there is a large glass of the usual full size that is placed in position, hermetically sealed under the lid, then the lid is placed down upon the body of the casket with a flange, and this falls into a groove which has been filled with common soft roof cement. Then the flange is pinched in so as to make the casket absolutely air-tight. This casket is susceptible of ornamentation, precisely as a wooden casket would be. It is but little more than one third the weight of a wooden casket, it is equally as strong, and costs but little more than one third of the wooden casket. It may be hermetically sealed and used for transporting bodies all over the country. It seems to me to be one of the most pleasing advances in this branch of sanitation. I wanted to bring it to your attention, and should something of this kind be brought to our notice and prove perfectly satisfactory, it might come into general use; the regulations all over the country might be made uniform and the transportation of bodies made more easily, and please those who need to be pleased, and the public health perfectly cared for.

DR. PROBST.—I simply wish to add one word to the report of the committee. It has not been so long ago when quarantine was thought necessary to prevent the introduction of infectious diseases by ships. This Association is in favor of transporting through the mails infectious matter, and we believe that can be safely done. We also believe that dead bodies can be safely transported, and the public have a right to demand that all unnecessary restrictions should be removed. We therefore still favor our report.

OBITER DICTA CONCERNING SANITARY ORGANIZATION.

By A. WALTER SUITER, A. M., M. D., Herkimer, New York.

A system of health administration without effective organization is a "ship without a rudder," subject to the mercy of every pestilential storm.

It is equally true that however near to perfection such organization may be brought, a similar comparison would likewise obtain without the moral, intellectual, and financial support of that portion of the public immediately concerned.

It follows, then, that the two essential factors needed for the accomplishment of beneficial results in this branch of public service are first, an arrangement so systemized that sanitary direction may be administered in the most practical and advantageous manner without conflict of authority, and second, the education of the public mind to a point of proper appreciation of the importance of the service required.

In pursuance of this line of thought, it has seemed to the writer that some suggestions may, not unprofitably, be made at this time and in this presence, in the hope of enlarging the scope and increasing the usefulness of local sanitary authorities—more especially in the line indicated by the latter of the two factors mentioned, namely, popular education.

The evolution of public health administration in the United States, since the establishment of the first state board of health, in 1869, keeps pace with, and is characteristic of, the wonderful precocity of the American people in every field of human thought and action. And it is a subject for congratulation that among the influences which have contributed towards our advancement and progress in this respect, that of the American Public Health Association has been the most potent and far-reaching.

The powerful impetus which it has constantly given to the establishment of state and municipal organizations, and the regulation of the same, has been well-nigh incalculable; and not the least considerable has been its influence in the popularization of the subject at large,—to the extent even that by precept and example it promoted the establishment, in 1876, of its analogue association, the British Sanitary Institute, in a country whose sanitary progress we had hitherto followed rather than led.

This Institute is now, it may be said in passing, appreciated in such high degree in England that it has recently assumed, by legislative enactment, official relations with the Local Government Board (the regnant central authority), as under its provisions no medical officer of health, sanitary inspector or surveyor, can be appointed without the certificate of qualification obtained under the examinations system of the Institute. It also successfully patronizes and conducts a school of instruction, together with lecture courses for popular education in sanitary science.

While it may seem that perfection is practically reached in this country by a scheme in organization which includes the health boards of cities, villages, and townships, each with its proper medical officer, and all acting in harmonious relationship with similar authority on the part of the state, there is yet, in the judgment of the writer, a most important phase of the general system that has not received the attention to which it is justly entitled.

This last remark refers to the establishment and encouragement of local sanitary associations having a semi-official character, to which public interest may be invited, and membership obtained therein by all persons whose intelligent consideration and appreciation of the objects involved leads them to be attracted. It appears probable that in accordance with our existing political divisions the towns, villages, and cities in each county (excepting, of course, metropolitan centres where special methods must necessarily obtain) might best be brought into concert of action and sentiment in the manner indicated and for the purpose named. The object of this paper is largely to offer suggestions which have long been entertained by the writer concerning a plan of organization with this end in view.

An appropriate name would be, "The County Sanitary Council," or, perhaps better, "The County Conference of Boards of Health." Provision should be made for the current expenses of the organization by a limited appropriation in the county tax levy, sufficient at least to cover the cost of stationery and necessary clerical service, together with the expense of room for meetings when the county court-house or other convenient public building cannot be made useful for the purpose. The council should be officered by the annual election of a president, vice-president, corresponding and recording secretaries, and treasurer, with executive and special committees such as are usually appointed for obvious purposes. The meetings should be held at stated intervals—not less than two in each year.

Here much might be said regarding orders of business, the most profitable subjects for discussion; proposals relating to executive direction in the matter of local sanitary service; and the value of conference upon the important interrelations and interdependence of local boards. The recommendations emanating from such conferences would be received and accepted as in great degree authoritative, and the material benefit which the surrounding community would derive by the awakening of new and abiding interest, resulting from the united deliberation of both professionals and laymen upon pertinent topics, need not be dwelt upon in the presence of learned and experienced sanitarians.

The membership should be both official and voluntary—each township and municipal board within the county to appoint one, two, or more delegates who may receive a *per diem* allowance to correspond with that now provided for the stated meetings of all local boards, together with mileage to and from the place of meeting.

The voluntary membership should be made up by undelegated members of the local boards, *ex officio* (if all are not delegated, as might be thought more feasible), and citizens who have especial interest in the study of sanitary or scientific subjects. Admissions to membership like the last-mentioned would tend greatly to enlist intelligent coöperation when required, as, proverbially, "public interest means public support."

Of course, the character of such an organized body would necessarily be advisory in all respects, under our present system, but its formal advice would have such moral weight as to be in effect official, and there are various possible circumstances which in the writer's opinion would best be met by the influences that might be exercised in the manner proposed. Such situations are so numerous and frequently present such complications that no attempt will be made to touch upon them in detail. Most of them, however, will easily appear to the sanitary mind. Every one present knows that lack of education on the part of the people at large, and inappreciation of the need for the requirements imposed, have always been the greatest stumbling blocks in the way of practical sanitation. The appearance of the health official is looked upon at all times by the uninformed public with needless apprehension and opposition, and his mandate is generally regarded as an invasion upon individual rights where individual interests are concerned.

In view of the foregoing statements, it certainly seems that no extended argument need be invoked to demonstrate the widely suggestive importance of assemblages of the kind proposed herein, whereby the citizen and the public official might meet in common council for the common good.

In thus briefly and imperfectly calling attention to this proposition, it must not be understood that any attempt is made to advance a new or unheard-of idea. The plan is fully represented by the several state conferences and conventions of health boards, such as are in successful operation in Michigan and Wisconsin; also Iowa, Massachusetts, California, Pennsylvania, and the Province of Ontario. I observe with great satisfaction that in addition to those noted, through the active effort of our distinguished secretary, Dr. Watson, a convention of local boards has recently been called in his state of New Hampshire.

I am not aware of any instances, although they may exist, where local boards have been brought together by the counties of any of the states in the manner indicated.

Under the English health system the county council is a very important feature. It is regarded as one of the central authorities, and to it is accorded administrative and supervisory functions.

The district council of health in France closely corresponds, although it differs from the English in being strictly advisory, the executive functions resting with the prefect and the police.

Let me urge upon the Association the value and importance of giving its powerful encouragement and aid in some formal manner to the plan proposed, in the hope that it may be universally adopted; and thus will be accomplished another advancing step in the evolution of practical sanitation.

Along with the question of consideration by the Association another thought arises which not inappropriately should find expression here:

It has reference to the apparent neglect to provide for special committee work upon one of the most pertinent topics promulgated by the fundamental declaration of principles, namely, "the promotion of organizations, and" (to that extent) "the measures for the application of public hygiene."

Obviously, there is a great field for study and statistical research associated with the organization of boards of health within the province of this body—their moral, legal, and administrative functions, and it is surprising that critical and comprehensive inquiry has not thus far been undertaken in the same systematic manner with which other departments of study are conducted by the direction of special committees appointed for the purpose.

The following language was used by an observing Pennsylvanian[1] at the last meeting of the American Medical Association at Atlanta, Ga., in an article[2] setting forth some of the legislative inconsistencies with which our distinguished confrére, Dr. Benjamin Lee, has had to contend in the Keystone state:

"The public is very slowly awakening to a knowledge of the utility of health boards and their work, but we are still wofully behind the times in many portions of the state. We have no boards of health in townships, although there is a total of 1,511 townships in the state"!

If such a remarkable statement can be made concerning the status of one of the oldest states in the Union and the next most populous, certainly it cannot be said that our omission in the matter of the "promotion of organizations" is accomplished.

I am fully persuaded that it is the duty of this Association at this time to authorize the creation of a special "Committee on the Promotion of Sanitary Organization"—the number and character of its membership to be determined by the Chair.

This committee should be charged with the task of making for the subsequent use of the Association a complete statistical report upon the present status of health organizations throughout all the states, territories, and provinces within its jurisdiction,—national, state, municipal, voluntary, and otherwise.

It should also collect and place in convenient form for reference, all laws pertaining thereto at present in force. It should consider and report recommendations concerning the many knotty problems associated with interstate and international relations.

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[1] Dr. Eugene O. Bardwell, Emporium, Penn.

[2] "State Medicine in Pennsylvania, and How we may Increase Its Efficiency."

The publication of a faithful statistical record such as is indicated would be invaluable as a reference medium, and would make a most notable addition to the published Transactions which already constitute a complete library of sanitary science in America.

In so many ways could the purview of this proposed special committee be amplified and made useful that I make no effort to touch upon them in detail.

I trust sincerely, however, that I may not have uttered this thought in vain, and, in conclusion, would express the hope that these by-the-way sayings may be believed to be faithfully, although hastily, said.

SOME THOUGHTS RELATIVE TO SANITARY LEGISLATION.

By U. O. B. WINGATE, M. D., Milwaukee,

Professor Hygiene and Diseases of the Nervous System, Wisconsin College of Physicians and Surgeons, Secretary Wisconsin State Board of Health.

There is no stronger evidence of the need of national health legislation than the heterogeneous mass of state and municipal sanitary laws and regulations which exist in the United States at the present time, and there is no more discouraging phase of sanitary administration than that which confronts the health officer when he attempts to enforce the laws intended to aid him in the performance of his duties, and finds that the courts will not sustain him.

Lord Beaconsfield has been quoted as saying that "The health of the public ought to be one of the chief considerations of the statesman," but we are forced to conclude that this admonition is too often sadly overlooked.

Older nations have seemed to realize the importance of national sanitary legislation, especially England, and the fact that her laws nearly all emanate from parliament accounts for the best sanitary administration in the world. Laws emanating from the most powerful legislative body in a country at once demand respect and become great educational factors. The fact that a new country does not require that degree of sanitary attention that older countries do, for the reason that the needs of strict sanitary measures do not become apparent until the problems of a more dense population arise for solution, has argued in times past against national legislation in this country, and also the lack of positive scientific data relative to sanitary science has militated against such legislation, but now both of these reasons have very largely disappeared, and the demands for a department of public health, connected with the head of the national government, and empowered to enact rules and regulations that have the effect of law throughout the entire country, is continually becoming more and more apparent to any one engaged in sanitary administration. I do not feel competent to give all the reasons why such a department would be of the greatest value to our country of any legislative steps that could be taken, even if time were at my disposal, for I doubt if such could be made apparent until after such steps had been in operation for a longer or shorter period, but I desire to call the attention of this Association to a few thoughts which have occurred to me, from time to time, while I have been baffled in some of my efforts as a municipal and state health officer working under the present regime.

I believe that laws pertaining to sanitation should differ very materially from other laws, inasmuch as they voice a scientific fact, and if applicable in one locality are applicable in all localities.

The commercial laws have a different basis, and it would not always prove justifiable to enforce the same laws in different states, but with laws voicing a scientific fact, no injustice can be done in providing for the same legal protection or restraint in one place as in another; in fact, an injustice would often be done by neglecting such provisions.

Take, for example, the question of vaccination, which has been before the world for the past hundred years, and which has been accepted by the great mass of scientific medical observers in all parts of the civilized world. If it is justifiable, and from the ground of the great body of sanitarians and scientific medical observers it certainly is justifiable, that a law providing for the vaccination of all children under two years of age, and revaccination as often as every seven years thereafter, if in the judgment of the local health authorities it seems necessary, should exist in Massachusetts, why is it not justifiable in all other states?

If it is necessary to quarantine diphtheria for a certain number of weeks in Ohio, why not in Wisconsin?

If it is deemed unsafe to disinter and remove a body dead from small pox in Virginia, why not unsafe in Minnesota?

If it is necessary to condemn certain articles of food as unfit for human consumption in Paris and Berlin, why not in Boston and Chicago?

And so we might go on from subject to subject that we are now attempting to regulate by sanitary law, but fail because there is no system of laws which apply to all localities.

We also note the great need of a system of statistics, not only pertaining to births and deaths, but to sickness, or the prevalence, especially, of contagious and preventable diseases. If a system could be adopted and conducted under rules promulgated by a national head, so that every locality would present by such statistics a regular system, how much it would add to our convenience in studying these vexed questions, as we should have to follow the same system in all states, or cities, or villages, thus saving an enormous amount of time and labor, to say nothing about the mistakes that must necessarily occur where no system exists.

But, undoubtedly, the greatest benefit that would result from having a national sanitary head would come through the promulgation and enforcement of necessary sanitary laws.

It has often come to my knowledge that the sanitary laws of a place are drafted by the local board of health, and too often by persons possessing no qualifications whatever for such work, either sanitary or legal, and often if there happens to be a legal qualification there is a total lack of sanitary qualification and *vice versa*. The result is that no protection is obtained, and the case is dismissed either as unconstitutional, unreasonable, or on some technicality.

In many cases, passably good laws have been enacted by one body of legislators in a city or village, but a change of political color takes place, and in order to undo, or in some way harass the opposite party, the law is repealed without any consideration of its value as a sanitary measure. In fact, no one qualified to advise in such matters is consulted in any measure concerning it.

State sanitary laws, enacted by our state legislatures, are, I am sorry to say, often not much better, and too often the most important measure is questioned in regard to its constitutionality and a repeal effected, or a most damaging delay in sanitary administration is imposed upon a long-suffering community. This all comes through the lack of a system of national sanitary law that should be enacted by the most powerful law-making body in the country, and enforced by the local authorities.

A system of sanitary laws, drafted by a national sanitary head, could be easily enforced, and the people would then soon see the value of advanced sanitation. Such laws would only be enacted after careful consideration, and on the recommendation of efficient sanitary authorities, stripped entirely from all political influences, and based upon the most accurate scientific knowledge obtainable at the present day.

Consider for a moment how such a system would operate: Given an outbreak, for instance, of small pox, in a city containing a large number of persons among its population but a short time in the country, a class many of whom do not understand the English language, and those who do, understand that the word "liberty" means license; a class that has no regard for the rights of their neighbors; no regard for sanitation whatever; in fact, they possess no knowledge of the dangers which accompany, or the serious results which follow, an epidemic of disease. The health officer attempts quarantine, but no attention is paid to his orders; he makes some arrests for disobeying the health laws, but those whom he arrests are dismissed by the court on the ground that the law is unconstitutional, or a sharp lawyer has discovered a flaw in the law, and the case is dismissed on a technicality. In the mean time, the disease continues to spread, as no sanitary regulations can be maintained. The better class of the community demand protection from health authorities, but the lawless disregard all authority in this respect, and sanitary law in that community practically is of no avail whatever. He is paid a salary to be beaten in court, and receive the abuse of both the law-abiding and lawless communities, and fails to accomplish anything but to cover himself and his reputation with disgrace and chagrin.

But suppose, instead of being defeated in the first case that he takes into court, when the lawless element refuses to obey he is enforcing a law promulgated by the national sanitary authorities, which is handed down to the state authorities, and from the state authorities to him, and in case there is any disobedience of the law or regulations when he attempts to enforce it, he gives this class of people to understand that it is a national law, and to be supported by all the powers which exist in the state and nation. How long do you suppose this class of people would attempt to resist such a regulation, or what lawyer would attempt to carry such a case into court and try to have it dismissed on technicality? Not only this, but such a law would provide for the reporting of every case of contagious disease that occurs, such report to be made to the local health officer, by him to the state health authorities, and by the state health authorities to the national authorities, and all rules and regulations relative to the control of any outbreaks of disease would be promulgated by the national health authorities, and their power handed down to the state authorities, from the state authorities to the local health authorities, and a complete system is established, equivalent to a military system, supported by the most efficient and powerful laws that can exist in a nation. Such a system at once establishes order and insures obedience. Besides, it becomes at once the best sanitary educational factor that can be established, for it will be universally respected because it is systematic and effectual, but without it we cannot expect to have anything much better than the present unsatisfactory and humiliating system, which has been by far too long in operation in a country so justly entitled to better things.

The time has already arrived when laws that were passed nearly a quarter of a century ago are being questioned in our courts. For instance, in a state which established a state board of health nearly two decades ago, where the state legislature enacted laws giving the state board power to make rules and regulations for the control of any outbreak of contagious disease that in the judgment of the said board might seem necessary and proper, there has, within the past eighteen months, occurred a circumstance well worth while to consider. The law very plainly provides that it shall be the duty of the state board of health to adopt such rules and regulations as in its judgment seems necessary and proper, and that such rules shall have the effect of law throughout the state. The state board, in obedience to that provision of law which has not been questioned since the organization of the board, adopts rules and regulations that are consistent with the law, and with the view of all sanitarians, and a lower court has decided that the law giving the state board power to make such rules and regulations, is unconstitutional on the ground that the state legislature cannot delegate any such powers to any board. As a result, all the rules adopted by the state board of health, according to the ruling of this court, are null and void, and the board practically has no authority, although acting in good faith for the past twenty years, to adopt any rules that have the effect of law throughout the state, and its only function is advisory.

Of course this case has been appealed to the supreme court for final decision, but this process requires, from the time the authority of the state board was questioned to the time of the decision of the supreme court, nearly two years.[1] Had such laws been promulgated by a national sanitary authority, and handed down to the state authorities, all such delays and difficulties would have been prevented, and the cause of sanitation would have received an impetus and power which has long been denied it, but which it well deserves.

Let us have a Department of Public Health in Washington!

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[1] Since the writing of this article, the Supreme Court has sustained the decision of the lower court, and declared the rules adopted by the State Board of Health nul and void, and unreasonable and unnecessary, although they were adopted in the face of an epidemic of small-pox.

SANITARY ADMINISTRATION IN UNINCORPORATED DISTRICTS.

By HENRY MITCHELL, M. D., Asbury Park, N. J.

Legislation relating to the care of the public health has given to local authorities in nearly all of the states the right, and placed upon them the duty, of preventing the spread of communicable diseases in their own localities, and it is consistent with the American system of government that local officers should be encouraged to perform the necessary functions for the protection of health and for the abatement of nuisances. But the spread of disease does not observe boundary lines, and the health of the citizens of the adjoining municipalities and of the country at large is dependent to a great extent upon the efficiency of the administration in each district, and while we find that in some rural localities a very high standard of sanitary administration has been attained, yet in by far the larger number of such districts there has been indifferent service or total neglect of all official duties relating to the public health.

Nor can better service be expected until some practicable plan shall be devised whereby intercommunication between the health officers of all of the local sanitary districts shall be secured, nor until the merit system for the selection of such officers, together with an assurance of a long term of office and reasonable compensation shall be established.

Typhoid fever, that infallible telltale of lax sanitary supervision, has been almost driven out of cities and large towns, and has become a disease of farms and small communities. Conditions almost universally exist on dairy premises throughout the land,—polluted wells and filthy stables,—which would not be tolerated inside the boundaries of cities and towns.

Numberless facts could be produced to show that the well-understood methods for the safe disposal of waste fluids; for the supply of pure water; for the isolation of persons affected by communicable disease, and for the cleansing of premises, have made slower progress in the unincorporated districts than in the more populous localities. And equally convincing testimony is abundant to show that the damage to health and injury to commercial interests which results from the sale of contaminated milk and from the unrestricted spread of communicable diseases, is not confined to the territory in which these conditions originate or exist, but on the other hand, it can be shown, as in the case of the typhoid outbreak in Plymouth, Pa., that the locality in which the disease is incubated and from which it is disseminated, often suffers but little compared with the neighboring towns to which the pestilence may be carried.

It has been found to be impracticable to provide and maintain in sparsely settled townships having large areas and small incomes from taxation, the same well-equipped health departments which have now come to be the usual and ordinary possession of nearly every progressive city in our country, and of necessity some substitute, some less expensive method of dealing with sources of danger to the public health, must be accepted. The per capita cost in such localities of even a very poor, and perhaps useless, health department, is often as large as that which is paid for the best service in the better organized communities.

One insurmountable drawback thus far in this new effort on the part of the government to conserve the strength and energy, and to promote the comfort and happiness of citizens, has been the fact that no available class of persons existed who possessed the requisite knowledge of the science and art of disease prevention, who could be called into service. Not only the members of township boards of health, as now constituted, but also the officers, have often been taken from among persons who did not realize the great value to the state of good health among the people, and who even after having accepted office, would not bestow upon the subject sufficient attention to learn the merest rudiments of the art which the law directs that they should apply for the benefit of their fellow-citizens.

The practical application of the principles of hygiene having become a highly developed art, the judicious enforcement of the laws and ordinances which are operative in many of the states for the promotion of the public health, can only be successfully accomplished under the guidance of persons who have acquired familiarity with the science upon which the art rests.

Who, unacquainted with the knowledge which has been accumulated relating to astronomy, would attempt to calculate the time for the reappearance of a comet?

Is it less presumption on the part of a wholly unsophisticated individual who chances to hold an official appointment to undertake to guide and direct his fellow-citizens concerning the maintenance of the purity of air, soil, and water; to venture to literally take human life into his hands, and conduct the operations which may, if wisely directed, avert a pestilence?

Following is a brief reference to the systems of local sanitary administration in districts outside of the boundaries of municipalities in several of the states:

In the state of New York, the local board of health in such localities consists of the "town board" and one additional citizen. The "town board" is the governing body of the district, and is composed of the supervisor of the town, the town clerk, and two justices of the peace. This board of health appoints annually one physician to be the health officer of the town.

In the state of Maine, local boards of health in unincorporated districts consist of three persons, who are appointed by the governing body of the town. The governing body also appoints a health officer. The health officer holds office during the pleasure of the board of health, but the amount of his salary is fixed and paid by the governing body.

No appropriation is made for the uses of the local board of health, but their bills are submitted to the governing body.

In Massachusetts, towns may elect a board of health to consist of not less than three nor more than nine persons. If no such board is chosen, then the selectmen may act as a board of health.

In Michigan, township boards consist of the supervisor, the two justices of the peace whose term will soonest expire, and the township clerk.

In Iowa and Ohio, the local boards of health in townships are composed of the governing body of the township.

In New Jersey, the local board in townships consists of the three members of the governing body, the assessor, and one physician appointed by the governing body.

In Connecticut, by an act passed in 1893, a new system for the administration of the health laws in rural communities was established. Under this law, a county health officer for each county is appointed by the judges of the supreme court, and the county health officer appoints a town health officer for each township.

The county health officer is an attorney-at-law and the town health officers are to be " learned in medical and sanitary science." The county health officer is the legal adviser of the town health officers of his county, and his special duty is to bring suits, upon the complaint of the town health officers, when in his judgment such procedure is necessary for the execution of the laws.

The county health officers make annual reports of all of their doings to the State Board of Health. The town health officers make reports to the governing body of the township, to the county health officer, and also to the State Board of Health.

The Connecticut system, which has now been in operation about three years, seems to be giving satisfaction, and it probably foreshadows the solution of the problem of sanitary administration in townships.

In view of the foregoing considerations, the following propositions are presented:

1. By law provide that in each township or other local political division, outside of municipalities, the sanitary authority should be exercised by one official.

2. The local health officers should be selected under civil service rules, and their term of office should be five years.

3. The examination of applicants for the office of township health officer should be conducted by the State Board of Health.

4. The appointment of the health officer in each township should be

made by the governing body of the district from an eligible list to be furnished by the State Board of Health.

5. No health officer should be removed except for cause, and vacancies should be filled for the unexpired term in the manner provided for original appointments.

6. Local health officers should be required to conduct all of their official operations in accordance with rules and regulations approved by the State Board of Health, and they should also make weekly reports of their doings to said board, and annually to the local governing body.

7. The local health officer should be paid for his services by the local governing body.

8. All suits for the violation of any local sanitary rule, regulation, or ordinance should be brought at the instance of the local health officer, and they should be prosecuted by the district attorney or prosecutor of the pleas for the county, but no such suit should be begun until the necessity for its being instituted has first been agreed to by the State Board of Health.

DISCUSSION ON THE PAPERS OF DRS. SUITER, WINGATE, AND MITCHELL.

Dr. C. C. Hoadley.—Mr. Chairman and Gentlemen: I judge from the tone of the papers that have been read upon this subject this afternoon, that while possibly some of you may have been born in New England, you are not familiar with the methods with which we do business in Connecticut. You will find, if you look up our laws upon sanitary matters, that we have in operation a law which contains some of the suggestions the last speaker has made, and many of the points to which all of the speakers have referred.

It will take but a moment or two to outline the plan of operation in Connecticut and, by the way, let me say, I hope this Association will see fit to appoint a committee upon this matter of national legislation relating to sanitary affairs, to continue research, and to furnish that which the doctor from Wisconsin (Wingate) has alluded to. Formerly we had what is known as a township board of health, and among the men composing the board were a justice of the peace and one physician. We ound it was not a success. Whenever a nuisance had to be abated the health officer would issue orders, but it would be invariably against some individual, a friend, or some one of our board of selected men. What was the result? The selected man goes to the health officer and says you had better keep hands off, that such and such a man controls so many votes.

We have abolished that system, and we have now a county board of health officers. We have a lawyer in each county whose duty it is to act upon our advice, and to see that orders are enforced. We simply act in an advisory capacity and in the capacity of prosecutor. There is appointed for each town a health officer, whose term lasts for four years, subject only to removal for cause. We secure a report each month from every town in the state as to the number and character of contagious diseases which occur during that time. Every physician is required to report to the State health officer every case of contagious disease that occurs in his practice, and in that way the State Board of Health officer is able to keep in touch with the physicians, and he can tell at the end of every month how many cases of disease have occurred throughout the state. We find that this law works splendidly. Politics do not enter into it, and all things considered, the physicians work together admirably, giving us their hearty coöperation and support. We are also getting the public support in a way that we could not get before. The people understand now that an order by the health officer has to be enforced, that there is something back of it, something more than merely asking them to do it. I think this committee ought to be appointed, and the work is along a line through which this Association can accomplish a great deal of good.

Dr. Caverly.—I have just a word to offer in discussing the first paper on this subject, and that is chiefly to supplement the remarks made by Dr. Suiter, of Vermont having founded a sanitary organization. Our board of health undertook about six months ago to organize a county association of health officers, and incidentally asked the same class of people as compose this Association to join and take an active part, such as municipal officers, civil engineers, intelligent men of all classes and all professions, who were interested in a general or specific way in the study of sanitation. We have always encountered in the execution of our law in the state of Vermont a good deal of opposition, or rather indifference, that seems to be due more largely to ignorance than anything else. The indications are that the local organizations which I have mentioned, and which were suggested by Dr. Suiter in his paper, are going to overcome a great deal of the prejudice and ignorance that exist in regard to the enforcement of sanitary laws in our state.

The effect of such organizations in holding meetings twice or three times a year will be, as we have looked at it, twofold: It will have an educating influence on the public generally, as the proceedings of the meetings will be published in the daily press and discussed incidentally by those who are present at the meeting; and it will have a good effect on the health officers, who are usually country doctors, who are somewhat ignorant and indifferent to health matters in general and of the enforcement of the law. It will give health officers an opportunity to exchange opinions in regard to the enforcement of sanitary orders; it will give them an opportunity to compare notes as to the enforcement of the laws and their effect. Another effect which it will have, and a very important one with us, is to secure some uniformity of opinion in regard to the pay that health officers shall receive. This is an important item, and with us it has almost always been left entirely with the health officer himself to decide in each town.

The papers as a whole contain valuable suggestions, and their recommendations have a practical bearing upon the details of sanitary work in rural districts.

Dr. Leander P. Jones.—I have been very much interested in the papers this afternoon, and the idea of the establishment of a national bureau of public health is a good one. But it seems to me that the United States Congress should establish a college of preventive medicine, whose chairs shall be made up from representative medical colleges throughout the United States, and the occupants of those chairs shall constitute a college of preventive medicine, so that health officers can attend a course of lectures for the prevention of disease.

There is a variety of opinions as to what would be the proper course to pursue in order to stamp out disease, but if we had a college of preventive medicine, I am sure it would be a great advantage to health officers. I have been a health officer for some time and know the disadvantages that are encountered from time to time. I was the author of the law of Connecticut, and while it is not perfect, it is the best we could do and get. If disease breaks out, it is considered a small affair; if children die from that disease, it is considered a slight affair. But if a criminal comes into a town and steals $10, we get together an army of officers to hunt down that criminal. It is a disgrace to our country that many of the diseases exist to-day. A child that is born healthy and well, who dies from a contagious disease, is virtually killed, and some one is responsible for its death. We can prevent cholera from coming to this country when we try, but it is scarlet fever, measles, whooping-cough, diphtheria, and cholera infantum that are carrying off our children by the score. We are doing nothing practically to stamp them out. We should stamp out disease, investigate every cause of death thoroughly, and see to it that children are protected from disease as much as from crime.

Dr. Peter H. Bryce.—I take it that the papers we have heard read indicate three or four very well expressed opinions with regard to our present organizations in municipal health work. The first point seems to be a dissatisfaction and discontent with present existing organizations. The second seems to be a positive consensus of opinion as to the necessity for uniform municipal health legislation. A third point would seem to be the recognition that unity of municipal health work to be satisfactory must be enlarged. A fourth point would seem to be permanency of appointment of executive working officers, and a fifth would seem to be sufficient compensation for those engaged in the work.

These are points which, after fourteen years of executive work as a provincial health officer, I have recognized as necessary in Canada. We have permanent, efficient health legislation; we have not got a sufficiently large unit of municipal organization. We have got fairly permanent health officers; we have not got sufficient compensation. I am at one with the several writers who have read these papers to-day in the opinion that very much good could come if this Association were to appoint a committee from working executive officers to formulate from the existing laws of different states which have been outlined here to-day by the several papers, some comprehensive, yet simple laws which could be adopted by this Association and recommended for adoption to the several states, whereby we could not only have uniformity, but wherein several other desiderata might possibly be arrived at. I am quite certain, from what we have heard here, that the day is not far distant when not only the municipal health unit, but the state and national legislation, with regard to the important matter we have in hand, will arrive at a near solution.

DR. BENJAMIN LEE.—In regard to this matter of lack of sanitary organization, I wish to say that although I belong in, and represent, Pennsylvania, I was born in Connecticut. It is possibly due to the fact of my New England training and ideas that the organization of Pennsylvania from a sanitary standpoint has been somewhat retarded. In endeavoring to establish institutions in a state, we ought to find out how people like to govern themselves. Unfortunately, our State Board of Health did not carefully investigate this matter before endeavoring to force township boards of health upon our state legislature. Ever since the Board was inaugurated we have been endeavoring to get boards of health established in townships, and we have at each successive legislature failed. I believe it to be because in Pennsylvania the only unit of administration is not the township, as it is in New England and the Western states; the only governing unit or jurisdiction in Pennsylvania is rather the county than the township, and in obedience to that fact which we have discovered, our efforts now will be to establish in each county a board of health on the plan proposed by the gentleman from Connecticut, and it does seem, after all, that the Pennsylvania idea is the more natural for organization in this country.

With regard to Dr. Wingate's proposal that we shall have a national board of health, or some such national representative body, I think there is not one present who does not feel in harmony with that proposal. But I do not believe it is at all possible for a national board of health or for congress to formulate laws for the government of the states as regards sanitary police, etc. Unless we can prove that certain sanitary conditions interfere with the transportation of the United States mails, or in some other way become an interstate or national matter, congress or a national Board of Health would not attempt to formulate any laws to govern the states in their sanitary administration.

DR. CARTER.—In Iowa, we have over three thousand local boards of health, with as many health officers who are physicians. These local boards are all subordinate to the State Board of Health. We have discussed this question in our State Board and are in favor of national control. We believe that all State Boards of Health should be subordinate to national control. As we have three thousand local boards of health in our state that are subordinate to the State Board, we have uniformity of action. If we had national control, our State Boards would have uniformity of action, which I think would be much to our advantage. I am in favor of national control.

Dr. Daniel Lewis.—I simply wish to say that the appointment of a committee to consider this question is one of momentous importance. We have had in our state (New York) the same experience which the state of Connecticut has had, and are still laboring under the plans of local boards of health; but it is equally important in my judgment that this committee which shall be appointed shall be constituted of members who are not committed absolutely to a national board of health. I doubt very much whether, if we should attempt to vote in this meeting, we should find the majority of us were in favor of a national board of health and national sanitary legislation to take the place of state legislation. We need to go slow in this matter, and the committee to be appointed should be one of investigation, rather than a committee to make recommendations within twelve months. This matter should be kept in mind, namely, that legislation on this, as on other subjects, is a question of evolution. We cannot get through any legislature, state or national, the desired thing at the first effort. We may get something. When the time comes, an amendment may be secured to what we already have, but it is a question whether it is best to lay aside all the progress that has been made in state sanitary legislation and commence anew at Washington and try to build up another system, which may not be as perfect as the one we have, for a generation to come. (Applause).

NECESSITY OF THE STUDY BY SANITARY CONGRESSES OF MEASURES FOR THE PREVENTION OF BLINDNESS.

By AGUSTIN CHACON, M. D., of Mexico.

The prevention of disease constitutes the purpose of hygiene, bearing in mind the rule that it is easier to prevent than to cure. The idea is highly praiseworthy; but it ought not to confine itself to preventing the development of those affections which more or less seriously affect the general health of the system, or life itself. The loss of one of the senses and especially that of sight, not only injures the individual who has the misfortune to suffer such privation, but also society and the state in general. The blind man is incapable of contributing his quota of production, and has to be maintained at the expense of those who are competent to work. I do not need to exert myself much in demonstrating that the prevention of blindness is a matter as much worthy of being taken into consideration by a sanitary congress as the other question of preventing the development of a dangerous disease. In fact, it is hardly necessary to enter into such a discussion. The nation would obtain a considerable saving if it appropriated a part of the money which is intended for blind asylums, to the prevention, or at least to an attempt at preventing the frequency, of blindness.

This great misfortune is within the power of the state to prevent, and I now propose to show briefly the class of questions regarding the hygiene of sight which come within the competency of associations of public health.

According to the statistics given by Cohn and Siedelmann, out of 1,000 patients they found that

238, or 23.8 per 100, suffered from unavoidable blindness.
433, or 43.3 per 100, suffered from avoidable blindness.
329, or 32.9 per 100, suffered from absolutely avoidable blindness.

These statistics prove that a great deal more than half of the cases of blindness might very probably have been avoided if proper measures had been taken in time.

There are two diseases of the eyes which cause the loss of sight in the largest number of patients: atrophy of the optic nerve and purulent ophthalmia.

As far as the first group is concerned, that is, atrophy of the visual nerve, we unfortunately can do very little to cure that affection, or, to avoid it, prevent the causes which produce the diathesis, which in turn cause the degeneration of the optic nerve.

With respect to purulent ophthalmia, especially in new born children, hygiene can do much to prevent its propagation. I would with pleasure enter into details as to the way in which hygiene can attain this object, if I had not already done so in the paper which I had the honor to read before this Association at its meeting in Mexico, on the "Prophylaxis of Ophthalmia Neonatorum." I only desire to insist on the necessity of considering the way to render obligatory, a declaration of the existence of purulent ophthalmia neonatorum, a measure which would do a great deal toward saving the sight of many people, and would be of the greatest utility.

There are many other morbus secretions of the conjunctiva, which although not of as grave a character as that of purulent ophthalmia, certainly merit our attention, as they are contagious and sometimes attain the proportion of a real epidemic. I refer to certain cases of catarrhal conjunctivitis which are at times caused by the bacillus discovered by the American bacteriologist, Weeks. In places where there is a certain agglomeration of individuals, epidemics of catarrhal conjunctivitis sometimes appear, similar to one which I had an opportunity of observing not long ago in the Charity Hospital of Mexico City. Hygiene can take the most efficacious steps to prevent the propagation of this disease.

I beg my hearers to note that the diseases of the eye which are transmissible by contagion are those which affect the conjunctiva ; purulent and catarrhal ophthalmia to which we ought to add trachoma or granular conjunctivitis, a contagious disease that mostly affects the pauper classes.

With respect to trachoma, I have an important point on which to touch, and this is, that in the central tableland of the Mexican republic, in the City of Mexico, situated at an elevation of 2,270 meters above sea level, this disease is not found. I have attended a great number of patients for the eyes, and never have found one suffering from trachoma. A few of my learned colleagues have seen a case now and then, but it has always been in individuals who did not reside in the City of Mexico, and who had contracted the disease at a lower elevation and near the coast.

I would call your attention to the absence of trachoma in the elevated parts of the Mexican Republic, because the influence of high altitude on the development of this affection is and always has been very much discussed. For my part, I consider it indisputable, and also that there can be no question that the influence of race is less than that of the elevation above sea level. In fact, the City of Mexico contains many foreigners who are residents and who belong to different nationalities and races, but nevertheless we do not see a single one who suffers from granular conjunctivitis.

Special attention ought also to be given to hygiene of the sight in schools, as it includes some very important subjects, such as the best class of lighting for localities intended for schools, the requisites to be specified for text-books, the minimum size of the letters, length of the line, their distance apart, the color of the paper on which they are printed, etc. All these things are of importance to the care of the sight of the pupil, and would tend to prevent the development of myopia, the unfortunate inheritance of the learned classes. Equally necessary do I consider it to give attention to the conditions of the school furniture and the number of hours of study. A physician who has made a study of eye diseases ought to examine the eyes of the pupils, so that if they are not in a normal condition, he should limit the hours of study or even temporarily suspend them, and permanently suspend them if it should unfortunately be necessary.

With the same object of diminishing as far as possible the cases of defective refraction, and that these should be scientifically attended to, I beg to call your attention to the necessity of regulating the sale of eyeglasses and spectacles. The optician ought to be to the oculist what the pharmacist is to the physician. It would be unreasonable to authorize the pharmacist to undertake the treatment of a patient and to prescribe the necessary remedies; he must confine himself to preparing the prescriptions given by the physician, and cannot be permitted to make the slightest alterations or substitutions. Why do we regulate the sale of medicinal substances and not the sale of the crystals which are intended to correct the defective sight? Is not this kind of free trade injurious? A badly selected glass is sometimes the cause of ocular disturbances, amongst which the commonest are defective sight, asthenopia, heterophoria, the increase of myopia, which properly attended to and corrected would have remained stationary, and many other disorders of the eyes can also be caused by these means.

On the other hand, the prescription for glasses is not always so easy, and amongst all the studies of ophthalmology, that which refers to the anomalies of refraction is one of the most difficult.

It is, therefore, most desirable that regulations should be established for the sale of glasses, which are intended to correct the defects of refraction, and the optician ought never to be allowed to make the slightest alteration in the prescriptions of the oculist.

From the few examples I have cited, which require no multiplication, it is easy to understand how the learning and wisdom of the members of this Association might coöperate in the humanitarian task of procuring the decrease of the causes that originate blindness. I have left many other questions on one side, such as the way of preventing the development and propagation of certain constitutional diseases, such as syphilis, scrofula, tuberculosis, and leprosy, which occasion serious disorders of the sight, and on this matter, as well as on many others which are directly connected with public hygiene in general, I have not said a word, because I know that you have them constantly before you and that you dedicate all your strongest efforts and activity to the study of these important problems.

I close my paper, calling your attention to the fact that the foundation of hospitals and dispensaries where gratuitous advice will be given to patients who are suffering in their sight, would greatly contribute to the decrease of blindness, and I think that your authoritative voice ought to propose that these establishments should be opened in the greatest number possible.

For the present I have confined myself to indicating certain subjects of study, which at the same time have served as examples to demonstrate how it is within the jurisdiction of public hygiene to take measures for preventing the development and propagation of diseases of the eye. Later on, I may have an opportunity to discuss each one of these questions by itself, studying them with the care and attention that they deserve.

DISCUSSION ON DR. CHACON'S PAPER.

Dr. Lucien Howe.—I do not know of any more important question, as it strikes me, at least, that this Association could have to consider. When we realize the number of blind we have, and the enormous cost they are to the state, which has not been figured out exactly, the importance of the subject is at once evident. I have no exact statistics at my disposal that I can present to you at this time, but we know that in a large proportion of cases ophthalmia neonatorum is preventable. I have visited the blind asylum at Batavia, and the one in New York, and fully twenty per cent. of the cases are in the Batavia institution because of ophthalmia neonatorum.

I simply wish to give the substance of some resolutions I wish to present. First, in a large proportion of cases the disease is preventable. Second, that these cases are preventable only when we get them in the early stage. Third, the reason why we do not get them in the early stage is that the nurse or midwife who has them in charge says there is nothing but an acute inflammation, and that by pouring a little warm water into the eye of the child it will see again. When these children are brought to us for treatment, their corneas are ulcerated. The matter resolves itself into this, that these children should be placed in the hands of a competent ophthalmologist as soon as possible. New York state was the first to present and pass a law on this subject. I will not read it. It requires that every midwife and every nurse shall within twelve, or twenty-four hours at the latest—in some states it is twenty-four hours—report in writing to some legally qualified practitioner the condition of the child's eyes. A similar law has been passed in Maine, Connecticut, Pennsylvania, Ohio, Iowa, etc., so that we have now over twenty million people governed by that law. It is difficult, however, to get the law passed in some states. I am told by a representative from North Carolina that when he brought this matter before the state legislature and the legislators saw that it would interfere with nurses and midwives they said, "No, we cannot pass it."

I ask this Association to endorse the resolution which I am going to submit, as well as the work that has been done along this line. The secretary will present the resolution after the close of the discussion.

DR. F. C. VALENTINE.—Buffalo is always ahead; and, therefore, my predecessor has taken the wind out of my sails, and it only remains for me to corroborate what he has said by an illustration. About six weeks ago, a prominent gentleman of New York city brought his little son to me, who was eighteen months old. The attention of the parents was directed to him by cries of great pain, accompanying each attempt at urination. On examining the child, I found specific urethritis, verified by the presence of gonococci in the discharge. It was difficult to trace the source of the infection, but it was found that the nurse was suffering from this disease. I have no doubt many cases of gonorrhoeal ophthalmia originate from nurses. It seems that the nurse in this case was diseased, and in some manner, perhaps best known to herself, soiled her fingers and while bathing the child perhaps succeeded in introducing some discharge into the infinitesimally small meatus. If that is possible, how much more easy is it to introduce the virus into the eye, which certainly has a much larger aperture, and is just as good a culture medium as that of the mucous membrane of the urethra! Legislation in the matter, to my surprise, in one case, has done wonders. The Credé method has reduced the infections one eighth per cent., which means that 80 per cent. of the children who went blind after birth became blind from gonorrhoeal ophthalmia. Reduce that by eight, and then we will have only 10 per cent.

I cannot do better in closing my remarks on the learned paper to which we have had the pleasure of listening, than to side with my predecessor and urge upon the Association to take such action to enact a law everywhere that these cases shall be intelligently treated.

REPORT OF COMMITTEE ON YELLOW FEVER.

Mr. President and Fellow-Members of the American Public Health Association:—Your committee on the "Prevention of the Spread of Yellow Fever" had the honor to submit to you their first report at the meeting of this Association in Montreal, in 1894. Since that time, there have occurred no events of special importance in the history of yellow fever, no discovery or progress, whether in bacteriology, prophylaxis, or therapeutics in reference to that disease worthy of being brought to your notice.

During the last two years, yellow fever has prevailed to a limited extent only in the Central American and Gulf ports of Mexico. Havana continues to be the threatening point of danger. The horrible unsanitary condition of that port is familiar to all. The social and political condition now existing in Cuba is not less frightful. Large armies of unacclimated soldiers are constantly being poured in from Spain, and the subjugation of the "Fiel Isle" is not any nearer to-day than it was in the commencement of the revolution. Cuba continues to be the scene of the most cruel and horrible butcheries of modern times. The beautiful island is being devastated by a war of savages. Let us hope for the sake of humanity that justice will finally triumph.

The condition of affairs now existing in Cuba can only tend to encourage the spread of yellow fever and increase the danger of importation to our shores. According to a Havana cable of August 12th to the *New York Herald*, there are not less than ten thousand Spanish troops down with yellow fever and other diseases in the island. There are over three hundred physicians in the hospitals, but in some instances a single physician has to attend one hundred and forty patients. Twelve doctors of the army service are now down with yellow fever. Small pox and yellow fever are still spreading.

All due precautions have fortunately been adopted by the Federal and State Quarantine authorities, and their efforts so far have been most successful, not a single case having been imported within our limits.

We have fully demonstrated in our previous report that yellow fever never originates in any part of the United States. We have shown that it has always been imported from some of the Gulf, Central American, or South American ports, more particularly Havana, Vera Cruz, Rio Janeiro, and Santos. We have demonstrated further that whether in its original foci, or in localities in which the disease is subsequently introduced, yellow fever requires for its development special conditions of soil, climate, and temperature, with the concurrent influence of unsanitary conditions of the worst character. These conditions exist permanently in the original foci, and are to be found, in a minor degree, in many localities exposed to the importation of the disease.

It is a recognized fact that a soil saturated with decomposing masses of organic and animal matter offers the most favorable nidus for the development and spread of yellow fever germs.

We have seen that the great improvement made in the local sanitary conditions of many of our Northern cities, at one time devastated by the disease, had caused it to entirely disappear from their midst, and that even in yellow fever countries, such as Colon and Vera Cruz, the ravages of the disease seem to have diminished since the local sanitary conditions have been somewhat improved.

It is not within our power to change special conditions of soil, temperature, and topography, but many of the unsanitary features which are potent factors in the development and spread of the disease are certainly under our control. Low lands can be filled, raised, drained, planted with trees, or cultivated ; paving, drainage, sewerage will go far towards modifying and improving the health of towns and cities. A proper supply of water is among the first requisites. Garbage, filth of all kind, excremental matter especially, can be and should be promptly and thoroughly removed. In one word, all causes of infection are to be diligently removed and all means capable of improving local conditions are to be rigidly carried out. Local sanitation, at all times and in every locality desirable, becomes absolutely indispensable in towns and cities where yellow fever is most apt to be imported.

The same measures which have rendered our Northern cities immune from yellow fever visitations apply equally well to those countries where the disease is permanent and endemic. There, public and private hygiene are entirely ignored, and local sanitation unknown. Improved sanitation would no doubt diminish the ravages of the scourge by destroying or removing many of the elements which favor its development and spread.

As to the stamping out of yellow fever in its very cradle by the destruction of its germs in the very soil and stagnant waters in which it probably originates, this enterprise is beyond the scope and means of this Association. To accomplish this would require extensive and costly engineering works which could only be successfully carried out by the governments of those countries. Large tracts of land, whole regions, once uninhabitable on account of malaria, have been rendered to agriculture and human habitation through the achievements of modern sanitary engineering. Why should not such a transformation be realized in yellow fever countries?

Once more we ask, Is it not the duty of this international Association to call the attention of all interested governments to this important question, and urge concert of action on their part?

In the meantime, and as long as the dreadful disease prevails in countries so close to our shores, and in such direct commercial relations with us, our main reliance continues to be a strict and efficient system of quarantine. Let us improve by all means the sanitary conditions of our seaports and exposed cities, but let us, above all, keep out the foreign pestilence. Let us not wait to combat it, that it should have effected an entrance and crept in within our boundaries.

Louisiana owes too great a debt of gratitude to quarantine for one of its representatives not to extol the merit of an institution which has protected that state and the whole Mississippi Valley since 1878. The immunity we now enjoy is entirely due to our system of quarantine.

We now desire to call your attention to the danger which may result from the yellow fever patient himself, and from the manner of disposing of the dead. We believe, with Dr. Sternberg, that, "as in typhoid fever and cholera, the infectious agent in yellow fever is probably contained in the discharges from the bowels, and is not given off from the surface of the body or in the breath, as in the case of those diseases which are recognized as being communicated by personal contagion." Hence the necessity of destroying all infectious elements in the sick-room, of disinfecting the excreta and all articles which may have been infected. Hence the necessity of cremation, not only of bodies but of all contaminated material, such as clothing, bedding, blankets, etc. We have positive evidence that the germs of the disease may be conveyed in such infected material, and under favorable circumstances may multiply indefinitely outside of the human body, (Sternberg). Domingo Freire of Rio Janeiro asserts positively that the soil over the graves of yellow fever victims is saturated with microbian organisms exactly identical with those he found in the vomiting and blood of those who had died in the hospital of yellow fever. This characteristic parasite, says Dr. Freire, permeates the soil of cemeteries even to the very surface. These cemeteries are indeed nurseries of yellow fever, the perennial foci of the disease.

At the Pan-American Medical Congress held at Washington in 1893 Dr. Wolfred Nelson, who was at one time member of the board of health of Panama, and who resided for many years in yellow fever countries, read an interesting paper, showing that in the Isthmus of Panama, the practices of interment and disinterment followed there for fifty years or more, are directly responsible for an endless supply of yellow fever germs. In the old Campo Santo, of less than one acre in extent, year after year the same ground was dug over and over again to make room for new tenants. The greatly increased mortality following the digging of the famous de Lesseps canal soon necessitated the opening of a new cemetery. It was opened with great ceremony in July, 1884. Between July, 1884, and the 12th of April, 1886, that new cemetery had received for burial in the earth 3,884 bodies, apart from the hundreds buried in the *bovedas* or *fours* or *ovens* (another abomination which still exists in some parts of our own country).

Official investigation shows that a number of graves had four successive tenants from 1886 to 1891, in other words, that the new and large cemetery was dug over four times in five years. Coffins are seldom used. A coffin in Panama is deemed a positive luxury by the masses. The practice then was, and is now, to rent a coffin called by the French, in happy phrase *cerceuil d' occasion* (Nelson). Whenever eviction from the grave become necessary, the decomposing bodies, with or without coffins, were taken out of the gate leading to the field and there dumped under a fierce tropical sun. Occasionally, when the pile became too large it was burned. Is it not passing strange that this latter process,—primitive and uncouth form of cremation—should not have been at once and generally adopted under such circumstances? The pestilential conditions then existing in the Isthmus of Panama certainly suggested it, made it imperative.

Cremation, we repeat, is the only remedy for the rapid and complete destruction of disease germs which are otherwise indestructible. It alone can prevent that horrid saturation of soil and water, permanent cause of the development of the disease.

After reading the graphic description of Dr. Nelson who wrote *de visu*, one cannot but wonder that such practices, which, we are told, prevail in many Spanish American and West India countries, could have been carried out for so many years, and that, too, at the eve of the 20th century! How long will civilization permit such abominable practices? Is it not the privilege, the duty of this Association to enter a solemn protest and demand the active interference of all civilized nations, in order to put an end to such barbarous customs?

Now, in addition to all known measures of local sanitation, isolation, disinfection, etc., which tend to limit the spread of yellow fever, there are special measures applicable to certain localities only. The following refers more particularly to Vera Cruz, but is applicable to localities similarly situated:

We know that individuals who are attacked with this disease, throw out pathogenic germs, and these propagate the epidemic from house to house, and from town to town. We also know that the dead bodies constitute real hotbeds of these germs, and that one of these bodies is enough to give rise to an epidemic. It has been perfectly demonstrated that one of the epidemics of Cadiz, at the beginning of this century, was occasioned by the clandestine burial in that town of the body of an individual who had died of black vomit on one of the ships anchored in the port; and that the first victims of the epidemic were the very persons who took part in that burial. It is also well known that the epidemic of yellow fever which spread along the entire length of the Mexican Pacific coast had its origin in Mazatlan, where the body of a person who had died of that disease, on board of a ship on her way from Panama to San Francisco, was buried. We thus see that diseased persons and dead bodies are sources of disease germs which produce and propagate the disease, and that for these reasons the hospitals and cemeteries become immense foci of infection which powerfully contribute to the propagation and prolongation of epidemics.

Fortunately, as we all know, the germ of yellow fever cannot live in a rarefied atmosphere, or under a low atmospheric pressure; once it rises to a certain elevation above sea level, the germ is destroyed, or, at least, sterilized in such a manner that neither the sick persons nor the bodies of those who have died of this disease are capable of transmitting it.

In certain localities, such as Vera Cruz and Cordoba, hygienists could take advantage of this fact and thus eliminate the sources of infection that we above speak of from those towns. Orizaba is situated at an elevation of 1,227 metres above sea level; yellow fever has never originated in this town, although numberless persons have reached there who were suffering from the disease and although many of them have died and been buried in the locality, the disease has never spread. Now, with a good railroad service, it is possible to go from Vera Cruz to Orizaba in three hours and from Cordoba to Orizaba in less than one hour. Would not the progress of an epidemic in Vera Cruz or Cordoba be greatly checked, if instead of keeping the sources of infection above spoken of within these towns, persons falling sick with yellow fever were immediately forwarded to properly constructed hospitals way up on the mountain in the neighborhood of Orizaba? It is evident that all the germs, which in the low country would have contributed to the increase and extension of the epidemic, would either be entirely destroyed in Orizaba, or, at least, be rendered harmless. In these hospitals, situated outside of the yellow fever zone, the urine could be collected with a view to the preparation of the preventive inoculation of all persons descending from the central tableland to Vera Cruz. (Carmona).

Patients who, on account of their social position, could not be sent out of Vera Cruz beyond, or rather above, the ictherogenic zone, ought to be isolated within their houses and not allowed to have any communication whatever with persons who were not perfectly acclimated. All their excreta ought to be incinerated or destroyed by adequate chemical means as well as every contaminated article. In case of death, the bodies ought to be cremated; if not, at least buried in some place distant from the town, and situated to leeward, according to the prevailing winds. It would also be necessary to select a perfectly dry soil, in order to avoid pollution caused by the filtration of water, and the graves should be given the greatest possible depth. In those infected towns or localities where hospitals could not be built outside of the ictherogenic zone, they should be built outside of the town in the desired direction and carefully isolated.

In conclusion, we would recommend the following:

1. Extreme measures of local sanitation in yellow fever foci. Modifi-

cation of the soil, improvement of harbors, etc., by all means known to sanitary engineering.

2. Putting in perfect sanitary condition all home seaports and towns most exposed to infection.

3. A rigid and efficient system of quarantine against the introduction of the disease.

4. Abolishing forever the abominable system of interment and disinterment practised in Spanish American countries.

5. Wherever practicable, yellow fever hospitals should be established beyond or above yellow fever foci.

6. When this cannot be done, these hospitals should be established at a distance from centres of population in a desirable locality, and perfectly isolated.

7. Compulsory cremation of all bodies of persons who have died of that disease, and incineration of all infected material.

Respectfully submitted:

Felix Formento, M. D.,
Chairman.

New Orleans, August 22d, 1896.

CONTRIBUTION TO THE STUDY OF YELLOW FEVER FROM A MEDICO-GEOGRAPHICAL POINT OF VIEW.

By EDUARDO LICÉAGA, M. D., of Mexico.

For the fourth time I come before this Association with the object of continuing the labors that I commenced in previous years.

My object is to enable the American Public Health Association to realize the true situation of the Mexican Republic as regards yellow fever, and with the help of facts to dissipate the erroneous idea which for so many years has existed that it is a country in which yellow fever is always found throughout the whole extent of its territory.

The data which I am about to furnish refer to the months which have passed from the first day of September, 1895, up to the end of August, 1896.

* * * *

In Vera Cruz, which is the principal focus of the endemic, this existed during the month of September and beyond the middle of October of last year; but from the 19th of the latter month up to the 16th of May, 1896, not a single case of yellow fever was presented. A few cases were observed in the third week of May, a larger number in the first week of June, a suspension of attacks up to the first week of August, when three cases were observed; one in the following week and another in the week from the 15th to the 22d of August, at which date my information closes.

In order to continue my report in the same form as it was presented last year, I would remind the Association that it reached and included the 37th week of the year 1895. The present table commences with that date and concludes with the 34th week of 1896. It at once explains in the easiest manner my preceding statements. I would state that this table shows the number of cases of the disease which were recorded in the Military Hospital, Civil Hospital of San Sebastian, Loreto Woman's Hospital in the town, and in the fortress of Ullua. The total number was forty-five.

From the reports furnished me by the medical delegate of Vera Cruz, I find that out of the cases presented during the months of September and October of last year, twenty resulted in death, whilst no others have so resulted out of those observed during the present year. As can be seen, during the period elapsed since my last report there have been only forty-five cases of yellow fever in the port of Vera Cruz, which is the principal focus of endemia in the Mexican Republic.

* * * *

As I have already shown in previous papers, the Northern districts of Yucatan form the second endemic focus of yellow fever. In none of these districts has a single case of yellow fever presented itself during the time that has elapsed since my last report. This information is absolutely authentic, as it has been furnished me by Dr. José Palomeque of Merida, a distinguished physician and general secretary of the government of the state of Yucatan. The data I refer to are of an official and private character.

* * * *

As a proof that on account of the immunity enjoyed by the greater part of the inhabitants of those places in which yellow fever prevails under an endemic form, as it is in those others where it is not under that form, but is propagated as an epidemia, I shall now relate what occurred in Papantla, a town in the state of Vera Cruz. From this city, which is the principal focus of endemia, the disease was propagated to Papantla. The supreme board of health of the federal district had no information of that fact up to the 11th of November, 1895, date on which the attack had happily terminated.

As the states of the Mexican Union are entirely independent, the sanitary authorities of the federation cannot interfere in any way, except in cases where they have official information of an epidemic, and this information was wanting in the case I refer to.

When on the date I have mentioned, 11th of November, notice was received of the existence of yellow fever in Papantla, the board of health addressed the local authorities on the subject, and received several reports, amongst which the most important is that by Dr. Luna y Drusina, who attended the patients suffering from yellow fever.

According to the report of the above authorities, the epidemic commenced to develop itself in the beginning of August, and its origin was attributed to the contagion which had been carried by a company of the 13th Infantry, which had come from Vera Cruz and had stopped one day in Papantla on its march towards Tezuitlán, but this version could not be maintained because not a single soldier was attacked by the disease, either in Papantla or in Tezuitlán, nor was the epidemic spread in this last locality.

The account given by Dr. Luna y Drusina is, that a merchant of Papantla went to Vera Cruz and returned with a consignment of goods which mostly consisted of textiles. A servant of this merchant was attacked with yellow fever a few days after, and died on the 12th of August. As this servant had not been in Vera Cruz, he could not possibly have contracted the disease except by contact with the consignment of cloths. The family believed that the servant was suffering from a bilious fever and did not burn the clothes that he had made use of, but threw them into a ravine in the neighborhood. On the opposite side of that ravine there was a house, in which the second case of yellow fever presented itself; this happened on the 19th of August—that is to say, seven days after the first contagion.

The patient was a young man twenty-eight years of age, up to that time healthy and robust, who had come from Tulancingo, a town on the central tableland where yellow fever never appears, and the inhabitants of which for that reason do not enjoy any immunity. This patient died, and the disease then showed itself in other persons dwelling in the same house; thence it was propagated to the neighboring houses, and eventually to the rest of the town.

After the departure of the company of the 13th Infantry, no member of which was sick, another force, composed of ninety men, reached the town, and out of those who were attacked by the disease, fifteen died. As has always been observed in these cases, the disease attacked the strangers and those who were born in the locality, provided they had not already suffered from other attacks.

The epidemic was especially strong amongst the soldiers and the poorer classes. The poverty of the latter, their ignorance, the bad hygienic conditions of the town, and the uncleanliness of the streets and public places, were the principal factors in the development and propagation of the epidemic.

As the local authorities gave no notice to the board, this corporation was unable to adopt the measures which are proposed in the Sanitary Code whenever a transmissible disease makes its appearance in any one of the States of the Federation. On the date on which the board received information of the fact, the epidemic had happily disappeared. Nevertheless, the board of health, through the channel of the proper department, called on the local authorities and on the government of the state of Vera Cruz, to give timely advice hereafter of all cases of yellow fever that might present themselves in any town of that state.

The board did not limit its action to this call, but it also stimulated the local authorities to take means for isolating the few patients who might be attacked during the endemia, and even, that in the sporadic cases, they should carry out a rigorous disinfection of the objects that had been used by the patients, or in any way had been in contact with them, as it had already been noted that the probable origin of the epidemic in Papantla had been the contagion through the medium of the merchandise.

After the many difficulties which have been encountered by the board of health, which is a federal corporation, for the establishment of a disinfecting stove in the city of Vera Cruz—which pertains to a state—permission was obtained from the local authorities for the setting up of a stove which had been deposited there ever since the year 1893. The installation has now been carried out in a convenient manner, and the disinfecting service has been placed at the disposal of the municipality and of private parties, and under the charge of the delegate of the board of health, who disinfects in that stove all the passenger's baggage that is to be shipped; and within a short time he will disinfect all the goods so as to have no repetition of the events of Papantla.

During the course of the present year, notice was received by the board of three cases of yellow fever in the port of Acapulco, to which place it is very possible for the epidemic to be carried by the Pacific mail steamers, which touch in the ports of Central America in which yellow fever prevails. But as the cases reported occurred in persons who did not come from Central America or who had not left the town, and as the disease has not subsequently been propagated in the port, it has very reasonably been concluded that the cases referred to were not of yellow fever.

* * * *

During the last few days, information has been received by the board of other deaths in the port of Manzanillo, the origin of which is suspected of being yellow fever. At this moment, a careful investigation is being made with a view of ascertaining if that disease really exists in that port, and the necessary measures have been ordered to be taken with a view to preventing its propagation. Should the fact be confirmed after this paper has been forwarded to the secretary of the Association, I will communicate what information is obtained in the meeting at Buffalo.

* * * *

Several isolated cases occurred last year in the city of Cordoba—and the paper on yellow fever in that district which will be presented by Dr. Mendizabal at this meeting does not refer to the present year, but is a history of previous epidemics.

From the above statements it will be seen that since my last report the Mexican Republic has only suffered from one epidemia in Papantla, and forty-five cases as a consequence of the endemia in Vera Cruz; but that the rest of our territory is now free from yellow fever.

Mexico, August 22d, 1896.

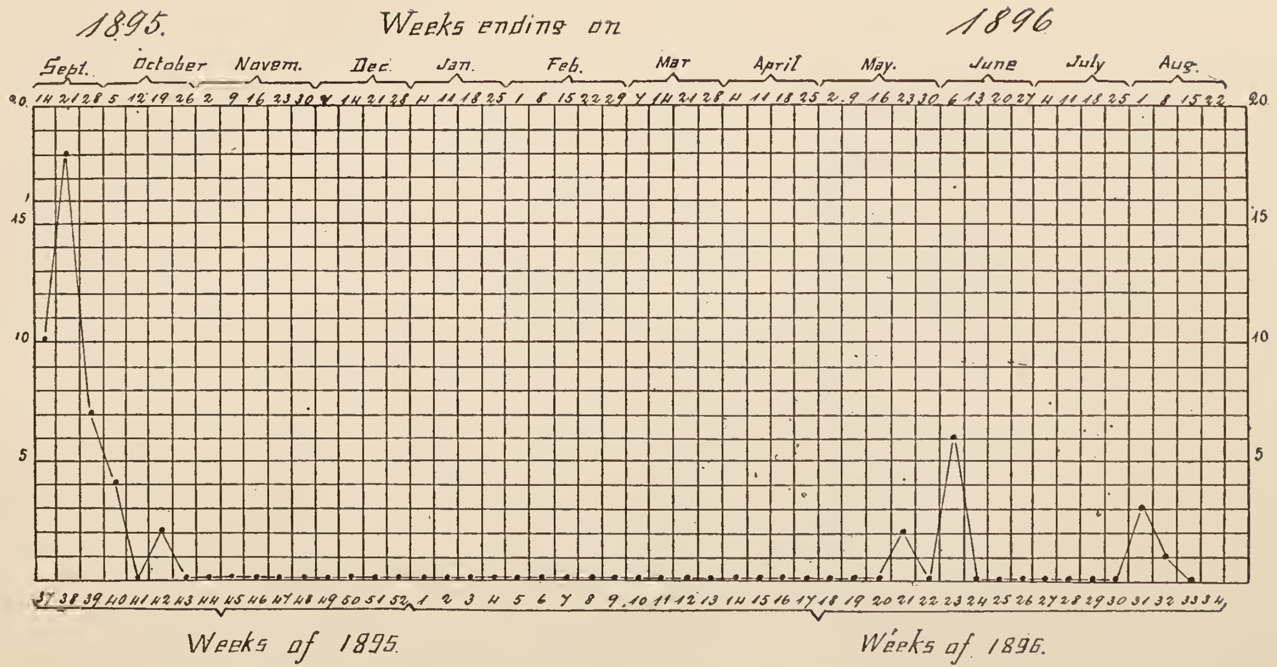

Diagram showing prevalence of Yellow Fever in Vera Cruz from September, 1895, to September, 1896.

CONTRIBUTION TO THE STUDY OF YELLOW FEVER IN RELATION TO EPIDEMICS IN CORDOVA.

By GREGORY MENDIZABAL, M. D.,
Delegate for the State of Vera Cruz, Mexico.

In some of the papers presented by me to the American Public Health Association, referring to the outbreaks of yellow fever in the city of Cordova, I offered to gather all the data which it was possible to collect, in order to form the history of these epidemics and present them to the Association.

An exhaustive inquiry into these invasions has been difficult; above all, into those which occurred in times long past, but, thanks to the interest which my colleague, Dr. Ernesto Chavez, the intelligent and laborious physician who lives in that district, has taken in the investigation, I am able to present in this imperfect paper a complete resumé of the number, intensity, duration, and mortality of each of these epidemics of yellow fever which have desolated, during three centuries, the above-mentioned city.

This work has appeared to me to be interesting, because, besides teaching us the ordinary mode of transmission of this Siamese evil, it enables us to fix the limits of the geographical range in our country, and gives ground to hope that the sanitary precautions which are exercised against this, as well as against all other infectious diseases, will free Cordova (as well as many other cities which are subject to the same conditions) from this awful plague, which sows desolation and terror among the inhabitants.

Moreover, our data will, if studied, serve to form a geographical chart of yellow fever with fair accuracy, and not incur the errors and exaggerations like those which we meet with among European authors, declaring that yellow fever is endemic on all of the coast of the Gulf of Mexico, besides in many cities, such as Cordova, to which I am about to refer.

These cities, it is true, are frequently visited by yellow typhus, and have, without doubt, within themselves all the necessary meteorological and topographical conditions for the existence and propagation of the pathogenic germs of yellow fever, but those germs are not generated there, but are imported; these cities, without doubt, will be freed from all future incursions by good hygienic measures.

Already my illustrious and industrious colleague, Dr. Licéaga, in some of his interesting writings upon this subject, has fixed with rigorous accuracy and based upon trustworthy data the true endemic range of yellow fever in our country, and thanks to his zeal and perseverance in the study of this disease, it is followed from day to day from its first outbreak, and it is combated with all the resources which modern science has placed within our reach, to stop its propagation and diminish its ravages.

This is not enough, however, to stop completely the ravages of future invasions in Cordova.

Moreover, this city, besides its climate and soil, its constant humidity, its proximity to Vera Cruz, and many other causes which favor the propagation of the morbific germs, has a great scarcity of potable water of the requisite purity. It has a system of latrines and privies altogether primitive, real " cloacas " which infect the subsoil and pollute the wells whence is obtained the drinking water, and also that used for all domestic purposes by the greater part of the inhabitants.

There is a reprehensible custom of dumping all the rubbish and refuse of the dwellings upon the vacant lots and open spaces of the city; and it will be easily understood that these, acted upon by the rain and heat, constitute, by their decomposition and fermentation, true foci, which poison the atmosphere and favor the development of any epidemic.

Some modern writers deplore, and with reason, the fact that yellow fever, which is one of the plagues which terrify the world, day by day gains ground and is spreading to districts hitherto free, in spite of the energetic measures for protection which enrich the precious arsenal of modern hygiene; this lamentation does not lack foundation, but it has an explanation.

The geographical range of yellow fever extends relatively to the means of rapid and frequent communication between places and communities; at present, Canada and England have been marked as the extreme northern points where it has appeared; Montevideo, Buenos Ayres, and San Pablo Loanda limit the south; Liorna in the east and San Francisco in the west.

It would not be impossible that it should propagate and appear any day in any other part of the world situated under the same conditions as those localities, where up till now it has raged; but it would only exist in places where the well-known hygienic precautions for prevention had not been practised, and where modern scientific methods are not used to extinguish the epidemic at the commencement, or where the dangers and consequences of the most insignificant neglect are not appreciated.

We have the most convincing proof of the incontestable efficiency of these precautions to stop the propagation of the plague and diminish its ravages in the eloquent fact of its disappearance, and the rarity of its invasions in places such as Charleston, New York and New Orleans, and many others, where formerly the plague was endemic; the same applies to many ports which have commercial relations with Vera Cruz, as Habana, Rio Janeiro, and other places where yellow fever is indigenous; and lastly, we have the practical fact that by practising with the utmost rigor the prescribed sanitary police measures at the first appearance of the epidemic, it is suffocated and extinguished in spite of the rapid communication between these places.

The yellow fever, in the literal sense of the word, has been losing ground, like all other epidemics among civilized people who protect themselves; and there is certainly the consoling hope that by putting resolutely in practice the protective sanitary measures universally recognized and sanctioned, such as disinfection of persons and things, and with each country, district, and inhabitant working with this object of improving the hygienic conditions of cities, houses, and individuals, that the day will come when the yellow fever will cease to be the terrible scourge which it unhappily is to a great part of America, and we shall only see it as an impotent enemy, confined to those regions on the globe where they neglect to extinguish it.

In the history of the epidemics of yellow fever which from time to time have decimated Cordova, we have a striking confirmation of what has been stated, and also a demonstration of the feasibility of erecting a barrier against future invasions.

The city of Cordova is situated on the boundary of the yellow fever zone, near the railway which connects Vera Cruz with the City of Mexico, and on the margin of the old high road.

The altitude is 847 metres above the sea level; its climate is warm; the rains are copious, and its soil is very fertile.

The district of Cordova is esteemed as one of the best coffee-growing countries of the world, both in yield and quality.

It produces in abundance pineapples, oranges, sugar-cane, tobacco, bananas, and all other fruits of a tropical country.

Malaria prevails in all its forms, and intestinal diseases peculiar to tropical countries are frequent.

Typhus and typhoid occur occasionally, but are exceptional.

I have not heard of these fevers at any time as epidemic.

The hygienic conditions, as I have before stated, leave much to be desired.

The city was founded in the seventeenth century, and there is no record or knowledge of any epidemic of yellow fever during that century.

The first epidemic of which the date is recorded was in July, in the year 1772, and lasted only three months.

It reappeared in the autumn of the year 1795, in which year five thousand persons were attacked, of whom six hundred died.

During the years 1796, '97, and '98, some isolated cases continued to occur, but the epidemic faded in the years 1799 and 1800, being a total during the eighteenth century of two great epidemics and four small ones.

The number and intensity of the epidemics of the present century have been as follows:

During 1801 and 1802, the epidemic which existed at the end of the previous century continued under the form of a small epidemic, which in 1803 took the character of a large epidemic, soon subsiding into small epidemics, which appeared at irregular intervals in the years 1805, 1809. 1813, and 1818, '21, '24, '25, '54, and '60.

In the year 1865, in the month of June, there was a great epidemic, which ceased during the winter and reappeared in the summer of the year '66, and faded in the autumn of the same year.

The last great epidemic registered was in the year '92.

The same circumstances were observed during the years '75 and '76, and the years '81 and '82. In the years '67 and '83, many cases were recorded. Total for the century now closing, seven great and sixteen small epidemics.

The frequency and gravity of the epidemics date from the year '65, which was the period of the principal work for the construction of the Mexican Railroad from Vera Cruz to the City of Mexico.

The frequent and severe outbreaks at this epoch are easily explained when we consider the conditions existing in Cordova at that time; viz.: an accumulation of unacclimatized persons living under the worst possible conditions of hygiene; the rapid and frequent communications with Vera Cruz; the neglect of all precautions, especially in not isolating the sick persons immediately on their arrival, each of whom became a centre of infection.

These circumstances combined, formed elements of combustion of the worst form; all the ensuing misery, the result of neglect of timely precaution, might have been avoided by stopping the lodgment of that spark, or suffocating it at its birth.

The epidemics of yellow fever in Cordova have nearly always commenced in the autumn, very seldom before the end of the summer. It has never been generated there, the germs having always been imported from Vera Cruz.

From this circumstance, and from the more frequent invasion, there is reason to fear, in my opinion, that yellow fever may become endemic in Cordova.

In one of the great epidemics, it was stated that some cases occurred in the population of Fortin, which is situated one hundred and fifty metres higher than Cordova, but after the fullest inquiry, I have not been able to confirm the statement.

In order to avoid such a terrible event as this scourge becoming endemic in Cordova, the measures which the supreme council of public health have so opportunely ordered are now in progress; a competent official has been appointed, who watches and wards off fresh invasions, and stops the evil at the outset, if unfortunately it has effected a lodgment.

It is the duty of the city to support the generous efforts of the general government; it is the duty of the municipal authorities to improve the hygienic condition of the population; to provide the people with potable water; to make that rich soil sterile to the germs of that terrible typho-icteroide; and in closing the doors forever against that desolating plague, to render the most important service to humanity and the country.

CONTRIBUTION TO THE STUDY OF THE PATHOGENY, ETIOLOGY, AND PROPHYLAXIS OF TYPHUS.

By FRANCISCO de P. BERNALDEZ, M. D., of Mexico.

One of the most interesting chapters in the study of infecto-contagious diseases, is that which treats of the etiology and pathogeny of these diseases, because it is from that chapter that we can deduce the practice and measures which ought to be adopted in order to avoid the infection, or, at least, prevent its development under an epidemic form. It is well known, that on account of their special character, infecto-contagious diseases are those which give rise to the great epidemics, that in the form of a scourge or public calamity within a very short period can decimate the population. Exanthematic typhus belongs to this group, and my object in presenting this paper before the present important meeting is to indicate the most probable and apparent indirect causes from which it arises, seeing that the direct or essential causes are as yet neither known nor suspected, and then deduce the conduct and hygienic practices that will tend to nullify them.

I ought first to say, that exanthematic typhus, according to the probabilities which almost amount to a certainty, arises from a micro-organism that has not as yet been discovered, but which, for many reasons which I do not give on account of their being so well known, undoubtedly exists. Besides this, as typhus is not developed in certain localities, we must also conclude that it can only be developed under certain climatological conditions. For instance, it is known that throughout all the litoral and generally in all the countries or districts which are called the hot country in the Mexican Republic the infection of typhus does not exist, whilst in the temperate climates at a higher elevation it predominates in an endemic form. For this reason, it will be easy to understand the difficulties which are encountered in preventing epidemics of typhus in the latter localities, where the typhus microbe finds elements which are favorable to its genesis and multiplication. To obtain this object it would be necessary to destroy constantly, just as it is necessary to be constant in destroying the weeds in the too fertile soil of our hot climate, where they suffocate and crowd the more useful cultivated plants.

If the enemy were perfectly known, it would be only a question of time and work which would always find its recompense in the benefits obtained by such destruction ; but as we have to struggle against an enemy whose presence we do not see, but only suspect, we do not get the advantage of the efforts displayed in full, and many of those efforts are wasted. This justifies, up to a certain point, the endemic character of typhus on the central tableland of Anáhuac ; the climate is favorable to them, and we are wanting in knowledge with respect to the biology of the germ which originates it. The opinion of Virchow, who said of typhus that it is "the penalty that a people imposes on itself for its ignorance and its indifference," is not absolutely exact; as Littré himself, notwithstanding his unbelief in the mystical theories that then prevailed as an explanation of the origin of epidemics, said with respect to infecto-contagious diseases: "In these everything is invisible, mysterious, everything is done by a Power that only reveals itself through the results."

In the present stage of our knowledge, we do not yet know what are these powers which manifest themselves by such terrible results, but we have strong reasons to suspect that they are vested in an excessively small being, although we neither know him nor do we know anything of the biological laws which govern his life. Well, now, the evolution of typhus in an epidemic form, is distinctly different in those countries where it is endemic, from those in which it is sporadic. In the former, the typhus germ may be said to exist permanently in a complete state; every epidemic is constituted by a series of contaminations, and its interruptions are only due to the number of immunities which have been conferred by previous attacks; to certain meteorological causes which I will speak of further on, and perhaps to the immunity acquired through custom or local acclimatization. In the latter case, in those countries where typhus only appears from time to time, the epidemic is preceded by a period of preparation or genesis, the knowledge of whose principal characteristic features we owe to Fauvel.

This author says: "The epidemic focus is progressively developed, causing in each grade a morbus condition which more and more approximates typhus, until at last the complete and undeniable typhus appears. For the full development of the epidemic, it is necessary that the typho-genic elements should have reached a certain degree of condensation, so to speak, and that they should act at high pressure, as on shipping, in hospitals, barracks, etc., and up to a certain point, this development also requires the rigor of winter in cold countries, which obliges us to increase the conditions that favor accumulation, through the confinement of our persons in localities that are comparatively narrow."

But even in those places where typhus is not endemic, the germ that develops it must have a preëxistence, and if it does not make its presence manifest, it is because it has not found a soil which is favorable to its development; but should this accidentally modify itself in favor of the germ, the typhus assumes a development that is apparently spontaneous, and it appears to originate in that place without having been imported. Really this importation has been made at a period more or less distant, and the germ has continued in that dormant condition until a favorable moment arrived for its evolution. Looked at from this point of view, the pathogeny of typhus is of the greatest importance, because in those countries where it is not endemic, we can, up to a certain point, provide against its attacks by preventing through disinfection, its importation from the places where it is produced, that is to say, which are already infected; and it has thus been observed and well proved that many countries which had been preserved from this disease, have become, after the lapse of a certain time, endemic foci of typhus, and we have a practical example of this in the city of Berlin. Fräntzel says that for many years past the disease does not entirely disappear from that city and that some isolated cases are every year seen in the hospitals.

The generating foci of typhus generally consist of a person who has acquired the disease, or of certain spots where the conditions favor the evolution of the typho-genic micro-organism.

No person now questions the contagion of typhus; it has been proved in the clearest manner, by numerous observations; but it certainly appears that there has been a good deal of exaggeration as to the degree to which this infection is contagious, seeing that it has been in many cases observed that propagation does not take place notwithstanding the circumstances that have favored it, such as the confinement and want of ventilation in the sick room, want of disinfection, cleanliness, and isolation. On many occasions, when in the course of my duties as sanitary inspector in the City of Mexico, I have had to see typhus patients, I have found that for six or eight days and sometimes for even a longer time, several relations of the patient have lived in the same room as the patient without any of them being attacked; and, notwithstanding their omission of the measures ordered by the Supreme Board of Health, with a view to preventing contagion. I repeat: if typhus is contagious, it is not so much so as other infectious diseases, such as small-pox, measles, scarlatina, etc.

In periods of epidemic, the contagious character of typhus increases; it appears to be more virulent, the cases of contagion then increasing in number; the probabilities of contagion are decreased by isolating the patients and placing them in well-ventilated apartments. It appears that the miasma of typhus, as I have already said, requires a certain degree of concentration in order to produce the infection in persons who are within reach of the focus. Besides, if care is taken to disinfect the excreta of the patient, as well as all his clothes and other articles that he may use, typhus will not be transmitted except in very exceptional cases. Out of 1,089 cases of typhus which have been reported by the medical inspectors of wards of the city, only 110 appear rising from contagion, and this in persons of the lowest class, who are so excessively careless in the practice of hygiene. The other centres of typhus infection are generally found in all those places that are wanting in hygienic conditions, and which are centres of organic putrefaction and decomposition. The accumulation in countries where typhus is endemic, is proved by observation to be a powerful cause for the development of this infection amongst the persons who come within its influence.

The accumulation is not engendered, as might be thought, by a number of persons of different ages, who live together in confined localities; this is altogether comparative, that which creates the accumulation is the relation between the capacity of the locality and the number of persons therein lodged, and especially the want of ventilation. It is for this reason that in the cities where typhus is endemic, strict provision should be enacted for the ventilation of dwelling houses, where people are crowded, and nobody ought to go into them until the air has been completely renewed. This provision is especially important when the room contains a typhus patient.

Of the other foci where typhus is developed, it has been observed that the disease is up to a certain point frequent in those houses that have imperfect drainage, as the drains then have a poor current and the excrementicious matters do not find an outlet. It is easy to understand that the emanations from these foci increase the mephitism of the dwellings when they are badly ventilated; and besides that, through the impurity of the air breathed in those rooms, the organism of the person there dwelling is deteriorated, and they are predisposed to contract the infection. This is the way, in my opinion, in which all the foci of putrefaction and decomposition of organic matters act on the human system. But, as I before said, these foci do nothing more than favor the accumulation, which is, so to speak, the centre of saturation of the typhus miasma, whatever may be its origin, microbes or miasmas. The number of typhus cases increases in winter; during this season, the cold obliges the people to close their doors during the whole night and even a part of the day; this confinement, which is almost hermetical, gives rise to the conditions of accumulation, and the typhus is its consequence. Observation has also shown us, that when the emanations of the closets or sewers or other foci of organic decomposition, are diffused throughout the atmosphere and not confined, they do not give rise to an infection of typhus; the laborers who are employed in cleaning sewers, do not suffer to any greater number than those employed in labors of another class.

Understanding in this manner the foci which favor the evolution of the typhus germ, the causes which predispose us to contract the infection are generally found to be those which depress the functions of the organism either permanently or temporarily; the excess of physical or mental labor; digestive or nervous disturbances, such as indigestion, a strong moral impression, etc. Amongst the determining causes, we have found that chills or abrupt changes and prolonged variations of temperature are those which more than others give rise to the predisposition to contract infection. Out of 415 cases of typhus which I have observed, and in which I dedicated special care to the investigation of the determining cause, I found that a chill accounted for 285. These chills may have been produced by exposure to the air, by baths, by rain, or dry weather, following a prolonged exposure to the sun. The flow of blood to the mucous membranes which is provoked by rapid and prolonged changes of temperature, and the nervous disturbances that set in with all their consequences, in the regular working of the organism, perhaps afford us an explanation of the genesis of typhus, as determined by chills; and it would therefore be advisable to avoid these chills, on the part of persons who are disposed to contract the disease, in all countries where typhus exists.

It has also been observed that in those years of light rains, the epidemic of typhus is developed with a greater intensity during the winter. It is not in our power to avoid or foresee this atmospheric disturbance, but in an indirect manner we can take steps to lessen the evil by a compliance with the prescriptions of hygiene, which are within our reach, and which I have indicated in the course of this imperfect work.

THE QUICK OR THE DEAD?[1]

By BENJAMIN LEE, A. M., M. D., PH. D., OF PHILADELPHIA.,
Secretary of the State Board of Health of Pennsylvania.

The title chosen by a gifted young American author for her first important venture in the field of letters was no mere clever arrangement of words designed to catch the eye, but the statement of a profound problem which the world, consciously or unconsciously, has been striving to solve ever since death first entered into it. And it was the statement of this problem in a concrete form, putting it into flesh and blood, that gave the book its popularity, rather than the regretable eccentricities by which the tale was marred. The problem presents itself in two distinct phases. First, how far should the dead be allowed to interfere in the affairs of the living? This is a purely legal question, which we need not stop to consider. It has never been decided in but one way except by Utopians. An advancing civilization more thoroughly permeated with the spirit of Christianity, or, as it is now fashionable in some quarters to call it, altruism, will some day reverse this decision.

Second, How far are sacrifices to the dead desirable or allowable? Such sacrifices have been offered up from time immemorial. According to the temper and disposition of the nation, they have been of the fruits of the earth, of articles of personal or pecuniary value, of the inferior animals, or of human beings. Within the memory of many of us, in the land of the mild-mannered followers of Buddah, the Hindoo widow has, with a thinly-veiled show of voluntary sacrifice, perished in the flames of her husband's funeral pyre; while it is little more than a year since hecatombs of slaves and subjects were immolated on the occasion of the death of an African monarch.

The North American Indians bury with or deposit near their dead warriors, their dogs, and bows and arrows, so that they may be able to follow their favorite pastime in the happy hunting grounds.

The Philadelphia papers have recently contained accounts of the annual memorial procession of the Chinese residents of that city to the cemetery in which the most of their dead are buried, the principal feature of which consists in depositing richly-cooked and expensively-decorated viands upon their graves. Of these the spirits are supposed to partake.

The motive for these pagan sacrificial offerings has been two-fold; first, to propitiate the spirits of the dead and thus avert evils which they might cause the survivors; and secondly, to demonstrate to others the regard and affection which the latter entertained toward their deceased relatives or friends.

If now we turn to comparatively civilized and Christianized times and countries, we shall find sacrificing to the dead still extensively practised. The second motive is quite as potent as among the heathen. The first is somewhat modified, but is yet based upon the pagan superstition that the *manes*, or shades, or wraiths, or spirits of the dead are in some way bound to the decaying elements, the nitrogen, carbon, oxygen, and hydrogen, which they once animated ; that they hover around, and are able to appreciate evidences of affection shown to their remains.

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[1] Read before the American Public Health Association at Buffalo, September 15 to 18, 1896.

One form, the most common form, which these sacrifices take is that of elaborate and expensive funerals. Every physician can recall numerous instances in which money enough has been spent in funeral pomp and glittering trappings to have paid for his own unrecompensed services and to have supported the impoverished family for months.

On this subject that trenchant writer, John Ruskin, aptly says: "Our respect for the dead, when they are *just* dead, is something wonderful, and the way we show it more wonderful still. We show it with black feathers and black horses; we show it with black dresses and black heraldries; we show it with costly obelisks and sculptured sorrow. * * * This feeling is common to the poor as well as the rich; and we all know how many a poor family will nearly ruin themselves to testify their respect for some member of it in his coffin, whom they never much cared for when he was out of it."

The procuring of an entire new outfit of external clothing for every member of the family of the deceased also often entails a pecuniary sacrifice of a most serious character. The mourning veil, and especially the widow's veil, is an instrument of sacrificial torture of an aggravated kind, dragging painfully on the muscles of the back of the neck and head, unduly heating the head, and interfering with vision, and embarrassing respiration.

Strangers visiting Philadelphia are struck with the heavy, close, white window shutters, with which the lower stories of all the older houses are protected, a relic of the great yellow fever epidemics of the last century, when large sections of the city were abandoned for months together. It was long the custom universally, and still is to a considerable extent, in case of a death in a family to keep these shutters closely barred for many weeks, not only those of the house in which the death occurred, but also of those of near relatives. The injury to the health of the survivors by this exclusion of fresh air and sunlight can readily be understood—a veritable sacrifice of the living to the dead.

How many a fatal case of pneumonia or other lethal illness can be traced to exposure at funerals, the mourners, whose vitality is already at a low ebb through depressing emotions and fatigue, standing on the cold, damp ground and baring the head to winter storms! Particularly have the ministers of religion been sacrificed in this manner. Fortunately, they are at length awaking to the fact that an enlightened Christianity does not demand these self-immolations, and are very generally adopting an appropriate covering for the head on these occasions.

The particular form of sacrifice to which I desire now to call attention, however, is that which consists in offering up human beings to the dead through the means of infectious germs in the bodies and vestments of the latter. This is accomplished by exposing the body dead of a contagious disease, such as small pox, diphtheria, or scarlet fever, with the face uncovered, either in the largest room of the house in which the death took place, or in a church; assembling a large concourse of people, and causing them to pass in single file, slowly, by the corpse, remaining stationary opposite the face for an appreciable time. Children are oftenest selected as victims of this rite, and their immolation is sometimes farther assured by inducing them to kiss the face of the dead.

I should be insulting the intelligence of this audience if I stopped to rehearse cases in confirmation of this statement. They are familiar to all of us. In some instances, in order to insure a larger number of victims, the infectious bodies are transported hundreds of miles and then again exposed, to procure new sacrifices.

All sanitary authorities are earnestly opposed to this ruthless sacrifice of human life under the sanction of religious ceremonial. They feel that their duty is to the quick rather than to the dead, and that the bier should not be converted into an altar on which the living may be offered up. To this end they make every effort to prevent public funerals in the case of those dead of contagious diseases, and to enforce such precautions in the preparation of such bodies for sepulture, and impose such restrictions on their transportation and exposure as shall put an end to these unnecessary deaths.

Of late, however, there has appeared a tendency among certain prominent sanitarians to relax these precautions. They inquire whether the science of chemistry has not advanced so far that, joined to a correct knowledge of anatomy on the part of the operator, it is possible so to prepare a body dead of an infection that not a single disease germ shall lurk in or upon it. They assert their belief that such is the case, and claim that when a body has thus been scientifically treated, all further care may be dispensed with. The instances in which epidemics have originated in the exposure of the dead in the house of mourning they explain by averring that the air of the house was full of disease germs; and those in which similar fatal catastrophes have followed the transportation of the dead, they attribute to contagium carried in the clothing of relatives who have been in attendance on the sick, and have accompanied the body to its destination and place of public exposure. There is truth in both of these pleas, but not the whole truth. The dead body itself, even after having been antiseptically treated, may convey and distribute living germs. In proof of this statement, I beg to submit the following case:

In the hospital for contagious diseases in one of our large cities, two children recently died at nearly the same time, and both were placed in the dead-house. The rules of the local board of health with regard to the preparation of bodies dead of contagious disease were strictly complied with. One of these children died of diphtheria. The other, of pneumonia as a sequela of scarlatina. Both were buried in a cemetery near the city. The death certificate of one named pneumonia as the cause of death; that of the other, diphtheria. In the course of a few days, the State Board of Health was applied to for a permit to transport the remains of the child that died of pneumonia to the home of its parents, in another part of the state, some three hundred miles distant. The permit was granted. Inasmuch, however, as the child had died in a hospital for contagious diseases and the body had lain in the dead-house in proximity to one dead of diphtheria, the president of the Board of Health of the borough to which it was sent ordered that it should not be taken to the house of the parents. It was, therefore, removed at once from the station to an undertaker's room. All trimmings and cloths were burned, and the body injected internally by nose and mouth, and also treated to a bath externally of Mills's and Lacey's embalming fluid. I am not familiar with the composition of this fluid, but it is safe to suppose that it is to a slight extent, at least, antiseptic.

The body was, therefore, subjected to a second disinfection at an interval of eight days after the first.

NOTE.—These regulations require that the body shall, immediately after death, be completely enveloped (and remain so enveloped) in a sheet saturated with a four per cent. solution of chloride of lime or a five per cent. solution of pure carbolic acid, or a 1-10 per cent. (1-1000) solution of corrosive sublimate, and be encased at once in a coffin or casket the entire inner surface of which (lid and all) shall be thoroughly and completely lined with a layer of raw cotton of a thickness of not less than one inch.

Before the burial and after these precautions had been taken, the family and friends were admitted to "view the remains." The child had been absent from home at an institution for teaching deaf mutes, for many months, and no member of her family had visited her at the hospital. The opportunity for seeing the face was brief, and as the features were necessarily somewhat disfigured, the body was hurried to the grave. Soon, however, grave doubts began to arise in the minds of the parents and others as to whether this was actually the body of their own child. This led to a disinterment, and closer investigation established beyond a peradventure the fact that they had buried another child in place of their own. Then came the startling thought—might not their own darling be still living? To determine this question, the body of the other child was exhumed and was at once recognized by the father and others as that of his own child. The body labeled "Pneumonia," and the transportation of which had been authorized as having died of pneumonia, had therefore, in fact, died of malignant diphtheria. Now mark the result: Although the body had been dead ten (10) days and had undergone two careful processes of disinfection at an interval of eight (8) days apart; although all textile materials with which the coffin had been lined and the body wrapped had been burned, leaving only the bare boards, yet, in spite of all this, four cases of diphtheria developed among the children who were present at the exposure, two of them being brother and sister of the supposed deceased. We have here, therefore, but two sources of infection, the twice disinfected dead body, or the wood of the coffin. If the latter, it must itself have become infected from the disinfected body, the germs having passed unscathed through a sheet soaked in a strong solution of bichloride of mercury and a layer of cotton wool not less than one inch thick. I may say, in passing, that an instance of the preservation of germs in wood for a long period has recently come under my notice. It is contained in the report of Dr. H. Garey, the county medical inspector of the State Board of Health for Somerset county, Pennsylvania, from which the following is an extract:

> "Two years ago a child died from scarlet fever about four miles from Downey. The cradle in which the child died was afterward sold at public sale, and purchased by parties having knowledge of the death of the child. They brought the cradle home and placed a babe of eight months in it to sleep. In about ten days a rash came out over the child, which made it quite sick. I was called to see the case, and informed them that it was a case of scarlatina. They were much surprised, as there had been none in the neighborhood for two years. This brought out the history of the cradle. They had washed the cradle at least six times with hot water, and did not think any germs could live after two years' time and different ablutions. The babe recovered, and another boy, aged two years, took the fever, then the mother, next the aunt, who had been helping to care for the children, then the grandmother, aged sixty years. After her, the father of the children. All had it in a severe form, but all finally recovered. There were no other cases in the neighborhood before or after, as I took the precaution of keeping persons away."

But to return from this digression. No sooner did the father of the child which had died of diphtheria learn of the mistake which had been made than he naturally enough applied for a permit to have it disinterred and brought back to the city for resepulture. This was granted with the stipulation, to which his lawyer was obliged to subscribe, that the box should be enclosed, unopened, in another zinc-lined hermetically-sealed box, taken directly to the cemetery, and not again opened. This, however, the father obstinately refused to accede to, insisting that he had a right to see his child and establish its identity, and threatening the board with prosecution if he were not so permitted. He was utterly impervious to argument or reason; in fact, he was in a condition bordering on mania on the subject, and, I have no doubt, had opportunity offered would have defied the law and smashed the coffin, in order to accomplish his purpose. I dwell on this in order to emphasize the fact that during the temporary phrensy which follows the death of a child from a contagious disease, especially if at a distance from home, parents are often irresponsible creatures, and there is no knowing to what risks they will expose themselves and others if their dead are returned to them.

A short time after the occurrence of the above-related facts urgent appeals were received from a distant town to allow the disinterment for the purpose of identification of the body of another child which had died of diphtheria in the same hospital.

In view of the evidence above adduced of the perils attending the transportation of those dead of contagious diseases, I submit that we should be very slow in relaxing any of the precautions and restrictions at present in force. That such bodies can be rendered innocuous within a few hours after death, so that they may be safely exposed to the close approach or contact of the living, may be asserted, but has never yet been proved; and until it has been proved by a series of carefully conducted tests, cannot be accepted as a safe dogma. If such bodies cannot be rendered innocuous, then their transportation becomes dangerous, not because the authorities granting the permit may not use every necessary precaution and impose every essential restriction, but because human nature is such that relatives and friends who receive the remains at their place of destination cannot be relied on not to break through all restrictions and violate all promises in their phrensied desire to look on the face of their dead.

The true solution of this question is to be found in the cremation of all bodies dead of contagious diseases. The ashes, which are the purified residuum and corporeal essence of the putrefying body can then be transported to the ends of the earth without harming any one. It has been well remarked, "It would be well for all if we could quit our habit of thinking that what we say of the dead or our conduct toward them is of more weight than what we say of the living, or our treatment of them."

One kind word, a single act of tender devotion to the living, is worth more than a thousand demonstrations of regard and affection to the unconscious dead.

PUBLIC BATHING ESTABLISHMENTS, WITH A DESCRIPTION OF THE NEW PUBLIC BATH IN BROOKLINE, MASSACHUSETTS.

By H. LINCOLN CHASE, M. D., of Brookline, Mass.

Mr. President and Members of the American Public Health Association :—Our distinguished secretary, Dr. Irving A. Watson, kindly invited me to prepare a short paper on "Public Baths." His request was made because the writer has the honor of being selected as Chairman of the Special Committee on Improved Public Bathing Facilities in Brookline, Massachusetts, a progressive residential town of some 17,000 inhabitants, adjoining Boston, but having no water front.

From a sanitary point of view, the effects of frequent bathing are the preservation of health and increased resistance to disease. It is equally true that a clean person makes a better citizen than an unclean one; in other words, health, morality, and self-respect are all greatly promoted by improved facilities for keeping clean.

Every city and town also needs some place where boys and girls may learn and practice swimming, which Benjamin Franklin maintained should be a part of our national education. Since the value of a really first-class public swimming bath, both as a promoter of health and as a means of acquiring and practising an art, the possession of which often saves human life, cannot be overestimated, the committee gave the subject careful consideration.

The best public and private bathing establishments in Boston, New York, Philadelphia, West Point, and Annapolis were visited by the writer, and both cleanliness baths and swimming tanks were investigated and their good and bad points noted. Plans, descriptions, and reports of more distant bathing establishments, notably those of London and Birmingham, Eng., and of various cities in Germany, were also obtained and utilized by the committee and its architect, and it is believed the good points of all have been incorporated in the new structure in Brookline.

The best water supply for a bathing establishment and the best system of heating the water are most important questions. To assist the committee in finding the best and most economical way of securing these, it called in F. F. Forbes, C. E., Superintendent of the Brookline Waterworks. After duly considering the taking of water from the village brook, which supplied the old public bath, from the open reservoir on Fisher Hill, used only in emergencies, and from the street main,[1] Mr. Forbes demonstrated the superiority of the last source of water supply, both as to purity and economy, and the advisability of heating both the building and the water[1] by steam from two horizontal, tubular boilers.

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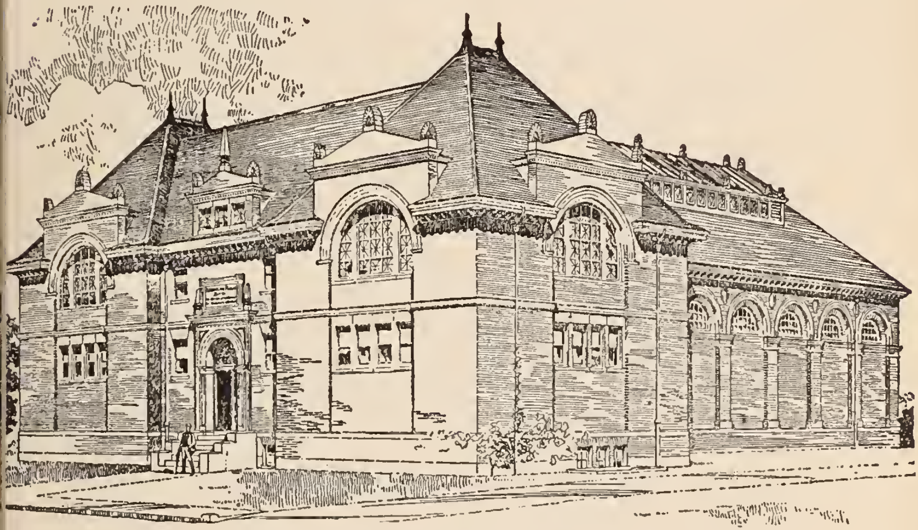
[1] Supplied by the same driven wells that furnish the town's regular supply of drinking water.

The best system of cleanliness bath for a public establishment has been found to be an improved form of shower bath, the so-called "rain-bath," which deserves some description. In this system no tubs are used, and a fine shower of warm water is substituted, which is made to fall at an inclined angle, the object being to avoid a vertical stream striking the head of the bather, an annoyance especially objected to by women. In the rain-bath, the bather stands erect under the shower and the water strikes the body from the neck downwards, the head being wet only when purposely placed under the shower.



Brookline Public Bath.
F. Joseph Untersee, Architect, 800 Hancock Bldg., Boston, Mass.

Among the advantages of this system are a great saving in time, so a given number of baths will accommodate a greater number of bathers. It economizes water and fuel, the shower consuming but three to five gallons of warm water per minute, while the tub-bath takes from forty to sixty gallons. The body of the bather does not come in contact with soiled water or surfaces, a very obvious advantage. Last, but not least, the tonic and mechanical effect of the shower-bath is greatly superior to that of the tub-bath.

The first general use of the rain-bath was by the German army, experiments with tub-baths for soldiers not proving successful. From the military service the rain-bath was introduced for public baths in Berlin, Vienna, Munich, Hanover, and, in fact, most of the other cities of Germany and Austria. Rain baths have also been provided for schools in Göttingen, Munich, and Weimar and are used almost daily by 75 per cent. of the pupils. Rain-baths have also been fitted up in a great many factories and manufacturing establishments. Comparatively recently German rain-baths have been introduced into the United States. Wherever introduced and fairly well conducted, the rain-bath has been used by steadily increasing numbers of people, of both sexes, different days or hours being assigned for their use. The committee carefully considered the many details of the system above mentioned and adopted it.

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[1] The temperature of the water in the swimming tank should be between 70 and 80 degrees.

Not less important than the cleanliness bath, in a public bathing establishment, is a commodious and well-built swimming tank. A good swimming tank in a bath-house attracts hundreds of persons there who would not come for the cleanliness bath alone. Since a warm shower bath (with soap) should be a prerequisite to entering the swimming bath,—and this will, of course, be insisted upon here as elsewhere,—many more persons will receive the benefit of a bath *with* than without the swimming tank. It must be remembered that the bathing habit is one needing encouragement everywhere; this is one reason why the cleanliness bath and the swimming bath should be under the same roof, to say nothing of the great saving in heating and service, as well as in the cost of construction.

The best shape, dimensions, and material for a swimming tank have received most careful study. A tank of fairly good length and moderate width, shallow at one end and deep enough at the other to permit of diving, and with floor[1] and sides of white glazed brick, is found by experience to meet all the requirements. A cheaper material than white glazed brick will either collect organic matter and become slippery and objectionable, or will destroy the *transparency* of the water. The swimming tanks in the gymnasia of the West Point and Annapolis cadets are of white glazed brick throughout, also the swimming tank (100 feet long) of the New Manhattan Athletic club, New York city, and of many others visited by the committee. It is well, also, to provide a small tank or plunge bath, to be used when the main swimming tank is not in use, and at all times for teaching children to swim.

The location of the new public bath in Brookline is the centre of population of the town, is close to its principal playground and its new High School. As will be seen, the plan is not for a second-rate bathing establishment, intended for any one class or section, but is for all the children and youth of the town. It has, therefore, a respectable building and an accessible location, with congenial surroundings.

The result of the committee's labors is a handsome, well-lighted, well-ventilated, T-shaped brick building, now nearly completed, which is to contain a number of rain-baths of the German "Gegenstrom" pattern

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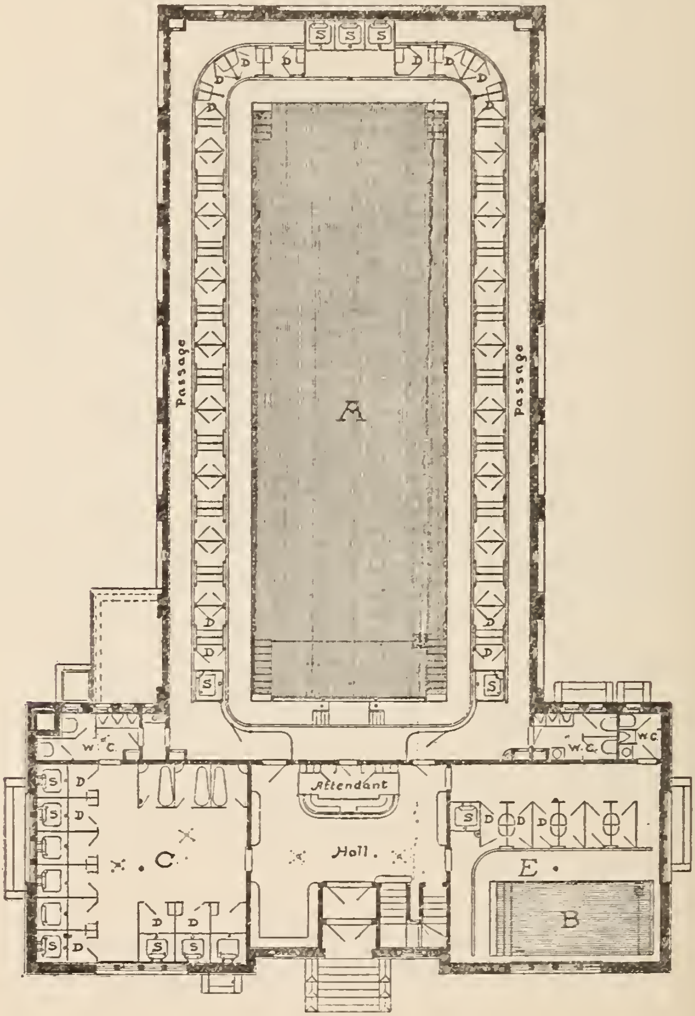
[1] The floor of the tank, however, is less slippery if covered with light adamantine mosaic, as in the Brookline Public Bath.

(with space for more in the future); three bath-tubs for those who cannot or will not see the advantages of the slant shower-bath; a swimming tank, 80 feet by 26 feet, average depth 4½ feet, lined with English white glazed brick; a small tank 22 x 10 feet, same material; some fifty dressing-rooms; a gallery for spectators, also serving for a running track; a steam laundry for the towels and tights; toilet-rooms, and meeting or lecture-rooms. A special feature found in two of the best and most recently completed bathing establishments of Europe (at Stuttgart and Hamburg) will be a passageway in *rear* of the dressing-rooms that surround the two swimming tanks, as well as in front of them. This addition has the hearty approval of Dr. E. M. Hartwell, director of physical training in the Boston public schools, and has obvious advantages, not only in convenience, but in keeping clean the passageway around the swimming tanks and consequently the water, a most important point, while also securing better ventilation for the dressing-rooms and better order among the bathers. I

INTERIOR OF SWIMMING HALL.

should be pleased, after we adjourn, to have you examine the diagram showing this new feature.

The water, constantly changing, will be heated by steam, the temperature being equalized and sustained by a pulsometer. The surface will be constantly swept by a superficial current of fresh water from one end of the tank, thus removing any floating impurities. At one end of the large swimming hall are three rain-baths, for the preliminary cleansing bath; at the other end are two.



The plans accepted by the committee were prepared by Mr. F. Joseph Untersee, architect, of Boston and Brookline, who has served in the German army, and so has special knowledge of model baths.

The cost of the Brookline Public Bath, exclusive of land, will be $40,000, voted by the town, and the cost of maintenance is estimated at $4,500 to $5,000 per annum.

This account would be very incomplete without special mention of the earnest coöperation of the writer's colleagues on the committee, namely, James B. Hand, Esq., formerly of the Board of Health, and Miss Martha W. Edgerly, of the board of overseers of the poor; also of Horace James, Esq., chairman both of the Board of Health and of the Public Bath Building Committee; F. Joseph Untersee, architect, the members of the medical profession in Brookline, and many other public-spirited citizens.

As far as the writer can ascertain, Brookline has the distinction of being the first town or city in this country to provide a municipal all-the-year-round bathing establishment containing swimming facilities, as well as cleanliness baths.

Above the main entrance, chiseled into a large stone tablet supported by dolphins, are the words

BROOKLINE PUBLIC BATHS.
THE HEALTH OF THE PEOPLE
THE BEGINNING OF HAPPINESS.

The establishment will be ready for use in October, 1896, when systematic instruction in swimming for the three thousand school children of the town will begin. When this Association, Mr. President, meets in Boston, its members will receive a cordial invitation from the board of health of Brookline to inspect its new public bath.

PERTAINING TO PUBLIC HEALTH IN TABASCO, MEXICO.

By JUAN MULDSON, M. D., of Mexico.

Gentlemen :—I have always entertained the belief that the object of these learned societies is not that of holding a scientific tournament and discussion, but rather that of procuring the improvement of the general conditions of life, both with respect to humanity in general, as well as specific classes in particular, whether the benefits are directly derived from meetings such as this, or indirectly from the influence they exercise. Only thus can we explain the decided interest shown by governments in being represented in such associations, or the heavy expenses they incur in forwarding the meetings. But we can easily understand this interest and these expenses when we consider the valuable information obtained, which each individual state adapts to its own special circumstances and necessities.

In the Mexican state which I have the honor to represent, the most urgent necessity lies in the development of population and particularly of a healthy and educated population that will forward the economical evolution of its resources. Under these circumstances, it is desirable to bring forward certain data that will entirely contradict or refute the erroneous ideas existing with regard to the salubrity of that lovely and wealthy region of the Mexican Gulf coast.

The boundaries of the state of Tabasco are: The Gulf of Mexico on the north, on the east, the state of Campeche, the Republic of Guatemala on the southeast, on the south by the state of Chiapas, and by the state of Vera Cruz on the west. It has an extension of 1876 square leagues, which are equivalent to 32,935 kilometers. The general outlook of that state is that of a vast plain, with a certain descent towards the litoral of the Mexican Gulf. It has, nevertheless, certain elevations and heights scattered over its whole extension, specially near that portion in its boundary with Chiapas. There are two large rivers that traverse the state in different directions; these have their origin from a multitude of smaller rivers and streams, all of which furnish a plentiful supply of irrigation to the soil, by their periodical overflowings, making it one of the most exuberant and fertile in the Mexican Republic. Recently, a great diminution in the amount of rain has been observed, owing, perhaps, to the fact that gigantic forests, so rich in precious woods, that existed there, have in their greater portion been abated by the axe. This diminution of excessive rain has brought as a consequence an improvement in the sanitary conditions of the locality, due to the fact that the quarter portion of its extension are lowlands, where in past years paludism reigned supreme and which malady has in later years decreased considerably, and has at present almost lost the malignant character it then had, for although cases of this disease present themselves, especially among new arrivals and foreigners, they are easily brought back to health by the well-known anti-malarial treatment.

The mortality in Tabasco during the year of 1894 among its 133,936 inhabitants was 4,220; and in 1895, 3,524 deaths occurred, which show us that the rate is diminishing, although that portion of my country is fast increasing in the number of its inhabitants, the majority of the new-comers being Europeans. I will now present before you a slight sketch of the diseases which predominate, and the character they present. First of all, paludism is the most common disease in my native land. It presents itself under the most varied forms, thus making its diagnosis difficult, although its treatment, as I said before, is generally successful.

I will next speak of yellow fever, although its occurrence there is so rare that it might be said that it is a stranger amongst us, though the general belief is that this disease is endemic all over the coast of the Gulf of Mexico; the fact being that it only endemically exists in Vera Cruz and in the northern coast of Yucatan, and that when it occurs in the rest of the coast, it is imported there from one of the two above-mentioned lands.

Several years have elapsed since this malady has appeared there, although a very active commerce exists with the neighboring state of Vera Cruz and Havana, the real foci of endemia; this I think is due, without any doubt, to the strict observance of the system followed by the sanitary authorities. In proof of this I will cite a case: Last year a man arrived at Frontera attacked by yellow fever; measures were taken to hinder the propagation of the scourge amongst other members of the community; these measures gave such satisfactory results that not a single other case was recorded.

Let me call your attention to another case of yellow fever: that of a gentleman, a resident of the City of Mexico, who about two years ago arrived at the capital of my state, who passed through Vera Cruz and was attacked by this malady in such a violent manner that he died a short time after his arrival at San Juan Bautista. He stopped at one of the principal hotels of the town, and on account of the shortness of his sickness, time was hardly given to take any prophylactic measures to avoid the spread of the disease in the locality. Nevertheless, and although the owner of the hotel and several of its inmates were foreigners, not another case of the disease appeared, either in the hotel or in the city. The facts above mentioned seem, to my humble judgment, to prove that Tabasco, on account of both its climate and the constant improvement of its sanitary conditions, is not at all a fertile soil for the development of the germs of yellow fever.

It is generally considered that one attack of the disease prevents another, and if it should be repeated it always occurs under a modified form.

Does yellow fever attack as often and with the same intensity the inhabitants of Tabasco, as it does those of the interior of the republic and foreigners? No; because it is a fact noticed there by my colleagues and myself, that it attacks the latter not only much oftener than the former, but with greater intensity, if they have not lived several years there and have by that means acquired, to a certain extent, immunity against the malady. I will here ask you to recollect the conclusions which our illustrious president, Dr. Eduardo Licéaga, presented in his address before the American Public Health Association, held in October of last year at Denver, Colorado. These conclusions, which I do not mention, because they are well known by all the members of this Association,—conclusions which, without a doubt, confirm what I have said as regards the sanitary conditions of Tabasco, and the rare occurrence of isolated cases of yellow fever never occurring endemically there. In that address, I find very important measures to be taken in the prophylaxis of the disease.

As regards certain diseases, especially those due to septic processes, the meteorological influence is so great over them, that although septicemia in its various forms, mainly puerperal infection, are quite common in certain portions of the state, they are generally so benign that they are very amenable to treatment, yielding under a slight antiseptic treatment.

CONCLUSIONS.

1. The sanitary condition of Tabasco is good in general.
2. Paludism is the principal disease, but it is satisfactorily treated.
3. Yellow fever is not endemic; it occurs in isolated cases, being generally imported and not finding a good soil for its propagation.
4. Isolation and other hygienic measures have successfully avoided propagation of the disease.
5. Natives are not as easily attacked by yellow fever as foreigners are, and this immunity reaches people accustomed to the climate who have lived there for many years.
6. The climatological conditions notably modify the clinical history of certain diseases, among which the benign course of septicemia forcibly calls our attention.

DENGUE.

By H. B. HORLBECK, M. D., Health Officer, Charleston, South Carolina.

Dengue, dandy fever, break-bone fever, eruptive articular fever, three-day fever, is an eruptive, exanthematous disease of a most singular and peculiar character, of a distinct and specific type.

The etiology and pathology are as little known to day as when Dr. Benjamin Rush described the disease in 1780, when it occurred in Philadelphia.

The object of this paper is to put on record a short account of a most widespread outbreak of dengue, which occurred in Charleston, South Carolina, in 1895.

Commencing in July and lasting until November, it is estimated that 50,000 of the 65,000 inhabitants had the disease.

Men and women seventy years of age, and infants had the disease, and while nearly every one in Charleston had it, it was not prevalent a few miles distant.

The cause of this singularity in distribution is most obscure. The advent of the disease was very sudden in Charleston, and people began to get sick, very, very sick, and in great numbers, to feel so sick and to be so full of pain and so prostrated that great personal alarm would be felt, and then after three days, fever; in many cases they got well as suddenly as they got sick, and were ready for the serious vocations of life almost at once after the disease, with no after consequences and no impairment of function in any organism.

Patients suffered acutely and horribly, in some cases crying out because of the pain, and always seemed to be suffering severely, while the mortality was strangely small, and where happening, death was probably due to a preëxisting complication.

There are many singular points about this disease, among others, the fact that it is often confined to localities of the healthiest nature, free from malarial taint; in those localities it is striking to note its almost universal prevalence, with almost every inhabitant sick sooner or later.

The infant is not exempt.

The aged are not exempt.

The disease attacks both races, white and black, and both sexes, male and female, indiscriminately, and all who have it suffer acutely.

The pain is pathognomonic of the disease, break-bone fever.

The negroes of the Island of St. Thomas called it the "dandy fever," from the patient's dread of motion, and consequently constrained attitude, and stiff and affected gait.

It is a fever of the most pronounced and acute type or character, with a temperature reaching 105 degrees Fahrenheit, and sometimes higher, as high even as 107 has been noted, and a pulse, in most instances, above 100 beats to the minute, this fever usually lasting three days.

THE THREE-DAY FEVER.

The disease is most sudden in the majority of cases in its attack, and the patient is at once very sick, a patient often being awakened at night, when asleep, by intense suffering.

A patient is sick all over and sick right off, but with all this sickness and all this suffering and all this alarm about the suddenness and severity of the attack, death is rare.

We have a record of deaths in Charleston for sixty-four years, commencing in 1822. During this time or period, dengue has appeared in 1828, in 1850, in 1880, in 1895. Nine deaths occurred among the whites and two deaths among the blacks in 1828.

In 1829, it is reported that three whites and four blacks died from the effects of dengue due to the epidemic of 1828.

In the epidemics of 1850 and 1880, there was not one death reported from dengue, although very widely and extensively present.

This is a strange record of an all-prevailing disease, where few escape sickness, and a sickness that is characterized by almost alarming symptoms. The disease involves the temperature and the pulse, in some cases the head, producing delirium, always headache, frontal or occipital, and often both, usually severe, sometimes severe throbbing.

This disease has prevailed in Philadelphia in 1780, in Calcutta in 1824, in St. Thomas in September, 1827, in St. Croix in October, in St. Bartholomew in November of the same year, in Antigua in January, 1828, in Havana in April the same year, in New Orleans in May and June and July and August, 1828, in Charleston and Savannah in September and October, 1828, and during the same period at several points on the Gulf of Mexico, and even along the Atlantic coast of South America. With the winter it subsided, having no more subjects to attack.

Since 1828, it has appeared several times in the Southern cities of the United States, notably in Mobile in 1844, in New Orleans and Natchez in 1848, in Savannah in 1849, in 1850 to 1852 in Peru, in Havana in 1855 and 1856, in Martinique in 1856, in Texas in 1861 (Matas), and through the Southern states in the same year; in 1866 in the Southern states again, in 1874 and 1875 in Martinique, in 1880 in Charleston, Savannah, and New Orleans; in 1885 a most extensive epidemic, exclusively limited to the state of Texas. In Charleston in 1895; in Savannah of the same year about 2,000 cases. Stedman relates that in a population of 12,000 in the Island of St. Thomas in September, 1827, almost every individual was attacked. The disease spared no one; there were no distinctions, rich or poor, robust or feeble. He says that physicians were invariably attacked, and so the symptoms have been minutely described. In this epidemic on the Island of St. Thomas, sometimes every person in a household, eight or ten at a time, would be down with the disease,—this peculiarly aggravating disease. Dr. Stedman records three fatal cases. Two were children about five or six months old, who died from irritation consequent upon a most severe desquamation of the cuticle followed by inflammation of the true skin that was from head to foot raw, and exceedingly painful.

In general, the disease gave a degree of respite for three, four, and, even in some cases, six weeks, and then attacked the joints, with more pain and paralysis than at first ; many persons were bedridden for several days. To them the slightest motion gave such intense agony as to call forth groans and shrieks of pain, even from the most resolute. Stout, able men were to be seen lying flat on their backs, afraid to move even the little finger, and hardly venturing to breathe. To lift the hand to the head seemed almost impossible, and they were consequently obliged to have their food put into their mouths as if they were babies.

A disease with all the suffering and alarming characterizations of a serious malady, and none of the dignity, if I may be allowed the expression, attached to a grave or fatal disease.

Dr. Samuel Henry Dickson describes very fully the disease as it appeared in Charleston in 1828 and 1850. It appeared in 1828, and then no cases are reported until 1850, a period of twenty-two years. He describes the first case in 1828 as occurring on the 10th of June, the second on the 20th. It spread during July with great rapidity, and ultimately attacked almost the entire population.

During the years 1828 and 1850, dengue usually made its invasion with pain, stiffness, and swelling of the smaller joints, or of the muscles of the limb, stiffness of the neck, aching of the back and loins.

These symptoms were followed by fever, with headache, full, quick, frequent pulse. The fever disappeared on the second or third day. . . . An eruption occurred on the fifth or sixth day in the large majority of cases. All persons equally and alike, the aged and the young, the infirm and the robust, the native and the stranger, the black and the white races, were liable to it. Very young children a few days or weeks old were seized—nay, some were supposed to be born with it.

The epidemic of 1850 was identical with the epidemic of 1828.

The disease was almost universal. Deaths were extremely rare, and Dr. Dickson saw none.

He says that "no epidemic of which I have ever read was so universal in its prevalence as this. It often happened that there was in a family no one well to attend the sick."

The latent period was prodigiously brief. Two persons coming into the city from healthy localities were attacked within twenty-four hours. Other instances were noted, of attacks the day after arrival into the city. He regarded the epidemic described by Dr. Benjamin Rush, occurring in

Philadelphia in 1780, and the two epidemics of 1828 and 1850 in Charleston, as identical and precisely similar.

The dengue or break-bone fever, he regarded it as a contagious disease. He says that it is an eruptive, arthritic disease. The cause of dengue is invisible, but no less a form of life, if contagious and reproductive. The pathology is obscure; death is almost unknown. It impresses few notable changes on the organism. Its seat is in the fibrous tissue, its nature altogether unknown.

A very old negro woman was ascending a stair, when she was suddenly seized with such severe pain that she was utterly unable to proceed. Her fingers, the chief seat of her complaints, were all of them bent, and could not be straightened, and the intensity of suffering was such that she lay prostrate, with tears and loud cries, and sobs. Some hours elapsed before she had any fever, and then there was but a moderate paroxysm. A supposed similarity to yellow fever has been asserted. Dr. Osgood of Havana has suggested that the cause, origin, and the nature of dengüe are identical with yellow fever.

Dr. Dickson says that it is scarcely necessary to do more than compare the descriptions of the two, to be struck with the strong impression of their dissimilarity.

Dr. Halliday, of New Orleans, has fully demonstrated their entire dissimilarity.

In Charleston, there is no record of any outbreak of dengue from 1850 to 1880, a period of thirty years. The disease appeared in June, 1880, to become epidemic in July and August. The disease presented the same symptoms that prevailed in 1828 and 1850.

Pulse full and bounding, 110 to 120. Temperature, 105. Severe pains in the head and lumbar regions and joints of the extremities. No swelling of the joints, but very severe pains. Eruption almost universally present. Attacked both races. No deaths reported. Relapse not general.

Dengue prevailed extensively and exclusively in 1885, in Texas, and during the epidemic Dr. McLaughlin, of Austin, made a number of careful examinations for bacteria.

In the blood he invariably found micrococci, often great numbers in the cell elements as well as in the plasma of the blood. Dr. Matas believes this as indicating a close causal relationship with dengue, although it needs fuller evidence.

About the commencement of the month of July, 1895, the dengue appeared in Charleston, to become widely epidemic in August, prevailing to a very great extent in September and October.

During the epidemic there were reported four (4) white and three (3) colored deaths. These deaths were complicated with diseases present before the attack of dengue.

The disease, as I have said, was most widespread—it was a common report that every one sooner or later had the dengue, and in some cases persons had it twice, and in one case three times.

It attacked white and black, males and females, rich and poor, old and young. The symptoms in 1895 were similar to those of the other epidemics that prevailed as above related.

Often a patient was seized without warning, awakened while asleep, with intense pains in head, lumbar regions, and extremities, accompanied by a fever, and followed by a rash.

The temperature constantly reached 105, and sometimes noted as high as 107.

Dr. Dawson, of this city, describes the onset as sudden; there are no prodromes; at first there is a slight chill, with a rise of temperature. The fastigium is rapidly reached. The temperature in the first twenty-four hours reaches 105 degrees Fahrenheit, remains for two or three days, and on the third day drops to 100 degrees. The pains were very acute and the suffering great. Pain in the head and back and limbs; abdominal pains were noticed, and sometimes very severe.

No position assumed by the patient gives relief. Swelling occurred in and about the joints, especially the ankle. No marked arthritic inflammation. The eyes were bright and injected. The urine scanty, acid, and high colored. The skin dry, and the bowels constipated. Constant nausea, but rarely was there vomiting. With the fall of the temperature the rash appears. The eruption in this epidemic was not always present; it occurred in about forty to fifty per cent. of the cases. The rash was not at all typical. It appeared in the palms of the hands, and it extended over the body. It assumed a great variety of forms, of cutaneous eruption, papular, erythematous, vesicular, pustular. The eruption was protean.

There was great restlessness, and marked inability to sleep; complete anorexia. The nervous depression was very marked, out of all proportion to the seriousness of the disease. In women the menstrual function was disturbed. Those who were pregnant were threatened with abortion, and in one case premature labor was brought on. Sometimes the patient was delirious,—sometimes from the onset. The tongue is described as something peculiar,—large and flabby, thickly covered with brownish fur; the teeth would leave a deep indentation; the edges were of a deep red color. The duration of the fever was so constantly three days, that the fever was called in the community, "The Three-day Fever."

There was no albumen in the urine. There was a tendency to hemorrhage from all of the mucous surfaces. There was epistaxis, diarrhœa with bloody flux, uterine hemorrhage. In pregnant women, owing to placental hemorrhage, abortion may be produced. In menstruating women, there is an increase of flow.

Dr. Kollock noted conjunctivitis, catarrhal and ulcerous keratitis, as sequelae of dengue; there was also in some cases considerable pain in and about the eyeball and felt principally during the movements of the eyeball.

Dr. Whaley, of Charleston, during the epidemic of 1895, made microscopical examinations in 36 cases (12, urine; 12, saliva; 12, fæces). In all these cases the blood was also examined,—and could not find a new organism, neither any abnormal bacteria.

Dr. Dawson thinks the rash due to trophic disturbance, which would explain the different forms which it assumes. There seems to be present a poison strong enough to upset the nervous centres, and produce the cutaneous eruption. Inflammation of the glands in various parts of the body is one of the complications; especially is this the case with the cervical glands.

I have endeavored to give you a description of a most singular, complex, and specific disease. It presents several points of great interest. The long periods between the outbreaks are singular. We do not know, nor have we heard, of its having been brought from anywhere in 1895, and so must conclude that for the last fifteen years there has been a latent germ of this disease present in the city of Charleston, awaiting the stimulus for reappearance. It was so in the thirty years between 1850 and 1880. No cases were reported during that period of three decades. Confined, with the single exception of the outbreak in Philadelphia, to a southern latitude, not being seen above a latitude of thirty-three degrees.

This disease is most marked in all of its symptoms. To be so alarming and to be so harmless to life and after well-being; to cause such pain and suffering that the most resolute in some cases cry out in agony; to be complex with a protean eruption; to be peculiar with the involvment of the fibroid tissues, and comparatively no swelling; to be so confined to southern latitudes as to suggest a like cause of occurrence as yellow fever, and yet to be entirely dissimilar from this disease. It is another of the problems of minute life or organism giving sorrow and suffering to the human race; affording another field for the microscope and the tireless work of the bacteriologist.

These peculiar outbreaks, phenomenally all-spreading and all-attacking, showing some minute form of life, give us another of the varied, and as yet incomprehensible, existence of the unseen and the unknown. That dengue is of specific origin, there would seem to be no doubt; that the virus of dengue should lie dormant for decades and then suddenly sweep a whole community, gives rise to the thought that meteorological influences of great power are at work, and affords a field for a better understanding of such occurrences.

> "Felix, qui potuit rerum cognoscere causas."
> —*Virgil.*

MUNICIPAL CATTLE AND MEAT INSPECTION.

BY DR. P. H. BRYCE, TORONTO, ONT.

MR. PRESIDENT AND GENTLEMEN OF THE ASSOCIATION: In the brief remarks I propose to make on the subject of my paper, I shall assume that the Association is agreed as to the necessity for the inspection of all food products, but especially of those so liable to become unwholesome, as of animals and their products. When it is remembered that there is in the United States a cattle population of 700 to every 1,000 persons, and when we realize that there is but the merest fraction of the animals of either Mexico, the United States, or Canada annually sent to foreign countries, it is clear that the health of these animals holds the most intimate relation to that of the citizens of our own countries. So important, however, have the commercial aspects of the export cattle trade appeared to the several federal governments that, notably in the United States, a bureau, that of animal industries, has been in existence for twelve years, which, under the able supervision of our old friend and member, Dr. Salmon, has exercised a most potent influence both on the reputation for health of the United States cattle abroad, and of their actual health status at home. The increasing influence of this bureau is seen in the legislation which within the last five years has been passed in at least fourteen states, whereby state boards of health or of cattle commissioners have undertaken more or less extended and systematic investigations of the reported presence of tuberculosis in their herds of cattle, and have, I believe, in all these instances, been provided with funds to compensate the owners of infected animals, for their destruction.

But that public sentiment which gradually becomes crystallized in legislation is further shown in the municipal provisions which in cities here and there have been passed for regulating by inspection the sale of meat, and in some possible instances by a close inspection and testing by tuberculin of all dairy herds. Pertinent as it might be to signalize, by describing the results of such investigations, the needs for these inspections, I do not purpose to inflict statistics already familiar, upon the members of this Association; but I shall endeavor to indicate the lines along which it appears to me practical inspection must be pursued and extended. Professor Law of Cornell estimated the number of milch cows of the United States at 16,000,000, and Canada has some 2,500,000 of similar cattle. This means that for the United States there is a number of cows supplying food products, nearly as great as the population of all the towns and cities of the Union. Since the merest fraction of these animals is kept within the borders of urban municipalities, it is manifest that the inspection must follow to their homes in the country. It would seem, therefore, advisable that there should be state and provincial legislation providing for the establishment of health districts much larger than at present exist, either in the Eastern states or Canada, and that officers, certified as to fitness by the state boards of health, as expert bacteriologists and chemists, should be appointed to perform, with a staff of sanitary inspectors, the health work of these districts.

The method of leaving the work to individual urban municipalities must necessarily prevail for a time, but it is obvious that with a large city getting milk supplies over many railroads, and from thousands of farms, some even outside state boundaries, and from a hundred rural municipalities, the supervision of the dairy herds becomes a matter of much practical difficulty.

The matter of municipal inspection of meat supplies for local consumption is on the whole a simpler matter, as may be gathered from the fact that municipal abattoirs have existed with success for many years in most of the great continental cities of Europe, along with an exact system of meat inspection, whether of animals brought for slaughter to the abattoir, or of meat brought from outside the city.

A few American cities have followed these examples, amongst which Boston may be cited as doing especially good work in the matter of inspection in tuberculosis.

In the report for 1894, of Dr. Durgin, the city officer of health, it is stated that all animals arriving at the Brighton abattoir are inspected, as well as those injured on the trains, which after slaughter are brought to the abattoir and then inspected. This work is carried on especially under the supervision of the state cattle commissioners, who since November 20, 1894, have made a systematic inspection of all cattle arriving at the different stock-yards of the city.

This state inspection extends to all cattle brought into the state, which must be subjected, before being set free, to the tuberculin test, unless when for immediate slaughter. It may be that other states and cities have advanced thus far, but if so, I am not aware of it, but it may be stated that the Province of Ontario has made a beginning in this direction by passing an act, at the last session of the legislature, which provides at present for the optional establishment of municipal abattoirs in all the cities and towns of the province, but also provides that when established, they shall be conducted according to common regulations adopted by the Provincial Board of Health and made an order-in-council by the governor.

The essential features of the provisions are inspection of all animals or meat introduced into any city or town, and provision for disposing of diseased or tuberculous meat, according to regulations similar to those adopted in Paris, Berlin, and Brussels.

The inspection of dairy cattle, as already stated, is one involving many practical difficulties. The cattle of the United States produce annually, it is estimated, an amount of milk equal to over seventy gallons per head, for the above population of the Union, and which, whether as raw milk or its many products, is potent for good or ill to a degree which cannot be overlooked.

Apart from the inspection by cattle commissioners or boards of health, of suspected herds, by what Professor Law calls the free-lance system, I am not aware that in any of the states or in any province, any serious attempt has yet been made to inspect by tuberculin, the herds which supply milk direct to our citizens.

This matter has been dealt with in Ontario, in the recent act of the legislature, but so far is made permissive. Whenever taken advantage of, however, the provisions for inspection will be common in all the cities and towns, and are similar to what has been found practicable in Denmark, and in such herds as that of the famous Deerfoot Farm in Massachusetts. It will be remembered that in the latter, in 1893, some thirty Jerseys out of a herd of seventy animals were subjected to the tuberculin test, reacted and were destroyed. After very thorough disinfection of the premises, the whole herd, eighty-six in number, two years after were tested by Frederick Osgood, V. S., chairman of the Massachusetts Board of Cattle Commissioners, without a single reaction or trace of disease occurring.

In Denmark, in April, 1893, an act was passed setting aside 50,000 crowns a year, for five years, for testing cattle with tuberculin.

The tests were not compulsory on stockmen, but the tests were supplied free. At first not much was attempted, but the test soon became very popular. By October, 1895, Professor Bang reports having inspected 1,972 herds, containing 53,313 animals. Of these, fifteen per cent. only of the herds were found free from the disease.

The work has been increased by a grant of 100,000 crowns being set apart annually for the work.

The routine proposed by the regulations of the recent Ontario act, provides for similar powers of eliminating the diseased animals which, while absolutely stopping their supplying public milk, will by a gradual process not entail any serious loss on the dairyman, while protecting the public. The adoption of this system by any city or town provides that payment by the dairyman, shall be made for the testing of his herd, as a prerequisite to selling milk within the municipality.

It is hoped that these remarks will serve to introduce discussion on a subject which is at once one of the most important and difficult to be dealt with by sanitary authorities.

ISOLATION HOSPITALS.

By JOHN L. LEAL, A. M., M. D., Health Officer, Paterson, N. J.

To one practically engaged in protecting the public health, the isolation of a person suffering with preventable disease, in such a way that no danger can result to the community from his presence in it, seems the first and most important step indicated. The danger to the community is measured by the promptness and thoroughness with which such action is taken. As in the great majority of cases it is impossible, or impracticable, to secure such isolation in the person's own home, some place must be provided which shall fulfil the conditions required. Such a place is the so-called " isolation hospital." For many years somewhat similar institutions have been maintained in times of emergency, or for the care of some particular disease of this class, but the idea of the " isolation hospital " proper is of very recent growth. Such idea is the possession and maintenance of an institution, to which all persons suffering with any kind of preventable disease, of a character sufficiently dangerous to the community to warrant such action, shall be removed ; by which numerous foci of infection to the community shall be reduced in number; and in which such persons shall not be exposed to other infection, but shall receive the benefit of scientific hospital treatment without increased risk to themselves. The aim of such an institution is not the care of the victims of an epidemic, but to make an epidemic impossible. Theoretically, it would seem the safer way to treat each of the preventable diseases in a hospital especially maintained for that special disease, but practically this is not necessary, and besides is impracticable for financial reasons.

In the details of construction and management of an institution of this character, more or less variation within the limits of safety is allowable. There are certain essential principles, however, which must be conformed with as far as possible. The location should be carefully considered, as regards the safety of the community, its general healthfulness and drainage, and its moral effect upon patients and public. The general arrangement of the institution should be such as to reduce the danger of interchange of infection to the minimum. Buildings should be substantial, well heated, lighted, and ventilated, and of as attractive an appearance as is consistent with due economy, and the purpose for which it is intended. Proper provision for the separation of the sexes must be made, and private rooms should be provided for the more refined class of patients. Furnishings should be plain to the point of severity, of such construction and material as may be most easy of disinfection. Comfort, however, should not be neglected, but is to be sought in so far as it is consistent with safety. Means for the proper sterilization of all clothing, bedding, etc., is an absolute necessity. Proper ambulance service should be provided; either different ambulances for the different diseases, or—what is much more practicable and reasonably safe—an ambulance so constructed that it can be thoroughly and easily disinfected. Finally, the general management and medical attendance should be of as high an order, at least, as is that of the general hospital.

Now, how is a community recompensed for the labor and expense involved in the existence of an institution founded upon these lines? In any community the presence and work of an institution which aids helpless or suffering humanity in any way, has a certain positive moral effect which conduces to the advantage of that community. In the case of the isolation hospital, we have not only this general moral effect, but we have also a special educational effect, which cannot but promote the public welfare. A properly equipped and managed isolation hospital will teach the people of a community more of the nature, restriction, and prevention of preventable diseases, than they would learn in many years by any other means. In the second place, such an institution provides for the proper care of inmates of hotels, boarding- and lodging-houses, household servants, and homeless persons of all kinds, who may suffer from this class of disease. Every well-ordered community makes some provision for its homeless or indigent sick as a mere matter of humanity. How, then, can it fail in its duty to that large portion of this class which a more exact knowledge of the nature of its disease bars out from that provision? Common humanity and its own self-respect demand that special provision be made. In the third place, there is good reason for believing that such an institution would be a decidedly paying investment for any community in which it was placed. The presence of preventable disease in the home, even of the industrious and self-supporting poor, is a burden of most crushing weight. Besides the ordinary expenses of sickness, which are always heavy, there is also usually a direct loss of income due to the restrictive measures in general use, and the fear of infection on the part of employers and fellow-employees. Should the disease spread to other members of the family, the burden often grows greater than can be borne, and the family, instead of being self-supporting and of value to the community, becomes a charge upon it. Thus we have not only this direct loss, but also an indirect one, due to the stoppage in the earning and spending power of that family.

If every person under these conditions attacked by preventable disease, were promptly removed to a hospital, and the necessary disinfection of premises thoroughly carried out, the probabilities are that there would be no further spread of the disease, and no serious loss of income to the family, and no consequent direct and indirect loss to the community. This economic gain will thus stand as an offset to the expense of maintaining the hospital, and investigations on these lines will show, I believe, a handsome balance in its favor. In the fourth place, and what from our standpoint is the most important of all, the possession of such a hospital is our most powerful means of restricting and preventing this class of disease. Every case of preventable disease occurring in a community forms a focus of infection for that community. Each such focus of infection is constituted of three component parts. First, and most important, is the patient himself. Second in importance, is the patient's immediate environment. Third, the persons exposed to infection by the patient or his environment, or both. Under certain and favorable conditions, such focus may exist with the minimum of danger to the community, as in one family roomy houses with sufficient air-space about them, and strict quarantine of its component parts. In the majority of instances, however, this condition of affairs is impossible, as in cases occurring in hotels, boarding- or lodging-houses, public institutions, apartment and tenement houses; or impracticable on account of the great expense involved. If, then, these cases are allowed to remain under these unfavorable conditions, they constitute a serious menace to the public health. In all probability the disease is conveyed to others, and fresh foci of infection are formed, with all the potentiality of evil which belonged to the original one.

It is this condition of affairs which is responsible for the prevalence in our midst of preventable disease. How serious to us is the existence of this type of disease, it is unnecessary here to discuss. We all know what losses to the sum totals of human life, happiness, and gain are due to its ravages. Having, then, these various foci of infection distributed through a community, how are we to deprive them of their power of evil and thus protect the public from their influence? There is only one way and that is by abolishing them. The first step in this process is the removal of the patient, whereby we relieve the community of that which is not only dangerous to its well-being in the present, but which threatens its well-being for an indefinite time in the future. Then the necessary sanitary precautions as regards environment having been taken, and those persons who have been exposed kept under observation, the indications of the case have been met, and the public safety protected. But the removal of patients presupposes a place prepared for their reception. In the nature of the case, this must be a hospital, and in this age of the world a hospital in fact as well as in name. Hence is involved the idea of the modern isolation hospital.

Proceeding upon these lines, we have just completed in Paterson, New Jersey, an institution of this character, the plans of which are submitted to your judgment as to how well the conditions indicated are fulfilled. There were certain conditions and limitations under which we worked, however, which must be considered in the making up of that judgment. We were limited to an expenditure of not more than $26,670, the proceeds of the sale of $25,000 worth of bonds. The site, fixed by necessity, was a hillside with a slope of twelve feet to the hundred on its most level part, which part terminated along its whole face in a sharp bluff twenty feet high.

The means of approach and the surroundings made it necessary to face the institution down the incline. The sewage of the institution had to be taken care of independently, and the water and gas had to be brought a distance of two thousand feet. Grounds had to be excavated and leveled, roads made, and bridges constructed. It was necessary to furnish enough beds to satisfy the present demands of a city of over 100,000 inhabitants, and to make possible future development on the same lines. Provision had to be made for the care and necessary isolation at the same time of patients suffering with, at least, three kinds of preventable disease, for the separation of the sexes, and for private rooms for certain classes of patients. These, then, being the special conditions and limitations imposed upon us, we have attempted to solve the problem in the following manner:

The institution is composed of eight separate buildings, each building distant at least forty feet from its nearest neighbor. They comprise an administration building, three pavilions for patients, a boiler house, a sterilizer building, a dead-house, and a stable. They are of hard-burned brick, pointed with red mortar, and with bluestone trimmings and slate roofs, with the exception of the sterilizer shed, the dead-house, and the stable, which are of wood. The administration building and the pavilions, connected by a covered but open corridor, stand in a row, two pavilions on one side and one on the other side of the administration building, facing and about fifty feet back from the bluff. The boiler house and sterilizer shed, one back of the other, are in front of the administration building at the foot of the bluff. The dead-house and the stable are to the right, about three hundred feet from the nearest building and from each other.

The administration building is of three stories, with wide piazza on the front and on one side which connects with the main corridor. It contains cellar and store-rooms, with laundry in the basement. On the first floor is the general kitchen for the institution, closets, general linen room for the institution, dining-room, pharmacy, office, and two water-closets, one for servants and one for officers. On the second floor are rooms for keeper and matron, nurses, physician, female servants, and two bathrooms. On the third floor are store-rooms and rooms for male servants. It is heated by direct steam radiation and lighted by gas throughout. Every precaution is taken to preserve this building from infection. In it eat and sleep all employees of the institution, except those in direct charge of patients, for whom provision is made elsewhere. Danger due to the presence of the laundry in the basement, is averted by putting everything through the sterilizer before it is admitted to the laundry.

The description of one pavilion will answer for all, as they are identical in arrangement. The pavilion is of one story with cellar and attic, and with piazzas at each end. Connection is made with main corridor by cross corridors from rear piazza. On this piazza open windows from service room and bath and disinfecting room. The door opens from piazza into a vestibule, from which doors open into a bath- and disinfecting room, a service room, and the main hall. The bath- and disinfecting-room is equipped with tub, shower, basin, bichloride spray, stationary commode, and slop sink. In this room the patient is received and prepared for further admission. His clothing is placed in a bag, deposited through the window upon the piazza, whence it is taken to the sterilizer building, sterilized and placed in patient's clothes closet. When a patient is about to be discharged, the room is first disinfected, then the patient disinfected therein, the sterilized clothing passed in through the window, and the patient dismissed.

The service room is equipped with sink, drip board, hot water boiler, with gas heater for use when there is no steam, gas stove for special and light cooking, steam warming table, dresser for crockery, and a closet for refrigerator and the various kitchen utensils. The food is brought to this room from the general kitchen on a wheeled carriage, passed through the window from the piazza, transferred to other dishes, the original dishes returned through the window in a tray containing disinfectant solution.

The hall extends from the vestibule to the ward. On the one side is the linen and general closet for the building, and a patients' room. On the other side is another patients' room and the nurse's room.

This room contains two beds, a closet, and has an observation window looking into the ward. Two nurses are considered the full complement of a pavilion. They eat and sleep in it, and are not allowed to come into contact with other nurses or employees, or, indeed, to leave the building, except for the regular exercise in a specified part of the grounds.

The two patients' rooms are similar. They contain one or two beds, as may be necessary.

The ward is the front half of the building, with windows on three sides, one of those on the end opening to the floor and serving as a door to the front piazza. It contains from four to eight beds. The floor and baseboard throughout the building are of asphalt, the walls and ceiling double and ventilated from the outside are plastered with adamantine, the trimming of well-seasoned hard white pine, perfectly plain and rounded at corners. All furniture is of iron, glass, and plain hard wood oiled. Every corner of building may be hosed out without damage, and floor is graded to escape pipes for the carrying off of the water.

The heating is by steam on the direct-indirect system. Fresh air is drawn in from the outside through heated ducts, passes through radiators into the room, where we also have the direct radiation from radiators. The foul air is drawn out through flues heated by coils of steam pipe, which flues extend above the roof. These flues are closed for purposes of disinfection by a system of tight dampers operated from the attic. The fresh air inlet flues and radiators are all so arranged as to permit of thorough cleansing and disinfection. The windows are all double, both for the purpose of economy in heat, and of assisting in the ventilation. The working capacity of both inlet and outlet flues is based upon the requirements of the maximum capacity of building. Twenty-one hundred cubic feet of air-space, eight feet of wall-space, and two hundred feet of floor-space are allowed for each patient.

The bedding consists of blankets to fold over the woven wire mattresses, sheets, cover blankets, and spreads. Pillows are formed by covering folded blankets with sheets.

Furniture consists of brass trimmed iron bedsteads with adjustable headrests and woven wire mattresses, iron and glass bedside tables, large iron nurse's table in ward, iron wash stand for patients' rooms, iron operating-table specially adapted for intubations and tracheotomies, easy, rocking, and rolling reclining chairs, all of plain hard wood.

Every room in the building, with the exception of the service room, has its own stationary commode. These closets are all on the pail system. Under each closet there is a recess extending through the wall, closed from the outer air by an iron door. This recess is floored with asphalt and its top and sides are lined with copper. A galvanized iron pail with a long wooden handle is pushed through the door from the outside until it fits snugly under the seat of the closet. This pail contains disinfectant solution, and may be withdrawn from the outside, and emptied into precipitation tank as often as desirable.

There is no communication between the main floor and the cellar or attic. They are entered from the outside and are only used as air-spaces and to contain the various pipes.

The lighting is by gas, and there is telephone connection with the administration building.

It will be understood, on consideration of the above details, that, unless by reason of accident, no one, saving those belonging in it, has occasion to enter a pavilion, with the single exception of the attending physician. He, moreover, is obliged to wear a close gown and a hood, and to disinfect himself carefully on leaving.

The nursing service is in charge of the St. Joseph's Hospital Training-school, and is performed by the pupil nurses of that institution, each nurse being required to serve two months out of her two years' training service.

Disinfection of building and furniture will be by means of thorough flushing, live steam, and bichloride spray. Bedding, clothing, etc., are sent to the sterilizer.

The chief aim of construction has been to favor in every way possible this process. The idea has been to make the pavilions general utility buildings, capable of being used safely in any way necessity may demand.

No attempt is made to devote a certain pavilion to the care of those suffering with a particular disease, but whatever its use may have been, after disinfection as above, it is regarded as ready for any purpose required.

In the boiler house is an arrangement whereby steam, gas, or water may be turned on or off any building independently of the others. The boiler for heating and sterilizing purposes is of fifty horse-power. An auxiliary boiler for use in emergency will be put in shortly.

The sterilizer is a steel boiler shell with an outer shell forming a steam jacket. The interior of shell is ten feet long and four feet in diameter. The bottom of the shell and the platform outside are tracked for an iron car which just fits inside of the shell. The car is loaded on the platform, pushed within the sterilizer, and the door working on an overhead trolley, is closed and fastened with swinging bolts. Steam is first turned into the jacket and then into the shell. In the jacket the steam pressure is limited to forty pounds; in the shell it is limited to fifteen pounds. A pressure of fifteen pounds will raise the temperature of the shell to 248 degrees in eight minutes after the steam is turned on. When sterilization is completed, a vacuum is produced by means of a steam ejector, the dry heat from the jacket continuing. The door is then opened, the car run out upon the platform, and the goods unloaded. This sterilizing plant is intended for city as well as hospital use, and we consider it amply sufficient for the purpose. Probably the most interesting point about it is its cost. A year or two ago my friend, Dr. Horlbeck, astonished us all by constructing a sterilizing plant sufficient for the needs of the city of Charleston at an expense, if I remember correctly, of about $1,200. This was, I believe, by far the cheapest plant ever erected up to that time. However, we have done a little better. Our plant, I think, is of somewhat greater capacity than the one in Charleston, and its cost including absolutely everything, but boiler and land, was $815.

Surely that brings this most essential apparatus within the reach of every town.

The stable contains three stalls and shelter for four wagons, including the ambulance. The ambulance is metal-lined and so constructed that it may be thoroughly flushed, and disinfected by bichloride spray.

The sewage is received into a tank in which it is precipitated and disinfected chemically. Solid matter is removed and used as fertilizer. Liquid flows off and through a set of three filter beds, whence it is piped to a field, and finally disposed of by broad irrigation. The total cost of this institution, including even the printing and advertising of the bonds, has been $26,500, leaving a balance of $180 out of the funds available.

We believe that this money has been well spent in placing in our hands a weapon most effective in the warfare against preventable disease.

DISCUSSION ON DR. LEAL'S PAPER.

Dr. Charles A. Lindsley.—There is scarcely a more practical subject in the present state of sanitary science than the subject of infectious disease hospitals. I am particularly interested in this matter because we have been struggling along this line in New Haven for two or three years. The legislature granted us the right to borrow fifty thousand dollars for such a hospital. The board of health selected a location for it, but through the intense opposition which was brought to bear upon the Common Council we were prevented from using it. Another location has been selected, and although it is a considerable distance from any residence, the opposition is very great, and I do not know but injunctions will be served. I wish to inquire of Dr. Leal if he has had such experience with the people of Paterson, or if we are peculiar in this sentiment of hostility and dread about the proximity of the hospital to residences. There is really but one hospital for infectious diseases in Connecticut, and that is in Hartford. It is located near the general hospital. I have never yet heard of an instance where contagion was carried from this infectious hospital to the general hospital, nor do I believe there is any danger of it with proper precautions. I would ask also, How much ground is possessed by this hospital upon which to erect the building?

The ground which has been selected at the present time as a site for an infectious hospital in New Haven, is a square of three hundred feet on each side. I would also ask, To what extent are the attendants at the hospital restricted from intercourse with individuals outside? I was told by the resident physician at the Willard Parker Hospital in New York that they permitted their nurses to go out into the city, taking only the precautions to bathe and change their clothing and to thoroughly disinfect themselves. I understood him to say that he never had the suspicion of the nurses carrying the contagious diseases which they had in the hospital to any one outside of said hospital. I have only one other question to ask, and that is as to medical attendants. Are patients permitted to employ their own physicians? And if so, to whom are the physicians responsible for their precautions in regard to the management of the hospital and of the patients and of their conduct while in the hospital?

Dr. H. J. Barnes.—I am not fully prepared to express my views on this subject, as I have not pursued my investigations far enough; but last winter my attention was called to the relative humidity of the atmosphere of our hospitals, and in Boston I made some observations and experiments and ascertained that in one of our modern hospitals for a week the average humidity was about twenty. It seems to me that such a dry atmosphere as we are accustomed to breathe in our houses, and which we put our patients in in public institutions in our northern climate, heated by steam or hot-air furnace, direct or indirect heat, is a subject that ought to be considered. My attention was first drawn to this matter in occupying an office in Boston where I was unable to raise the temperature of my room above 65°. I felt cold in that temperature, and in trying a wet and dry bulb thermometer, and using the tables furnished by the weather bureau, which was sufficiently accurate for all practical purposes, I found I was living in an atmosphere with a relative humidity of from twenty to thirty. A drier atmosphere is ordinarily obtained in the kiln-drying of lumber. It seems to me, nature establishes more healthful conditions by providing a relative humidity averaging sixty-five, and I cannot consider the air of our public and private buildings other than such as people are obliged to breathe in crossing the desert of Sahara. It is a difficult problem to determine how moisture can be introduced into the air and become effectively mixed in the wards of our buildings. In one house particularly, provision has been made for moisture by injecting a spray into the air current as it is admitted to the building, and I understand our capitol at Washington has some provision of that character.

I hope to pursue this subject more fully, and perhaps at the next meeting of this Association I may be able to give some conclusions.

Dr. J. D. Plunkett.—Dr. Leal's paper has been very interesting to me from a practical standpoint as a health officer. There is not only the question of selecting a site and building an infectious hospital, but the forcing of people into it afterwards. In our section of the country we are as yet defective on that score. I would ask one or two questions. I would like the doctor to give us in detail the *modus operandi* of disinfection, both as it pertains to the visiting physician and to the disinfection of the room. He has dwelt on disinfection, but he has not told us how he does it. I would be glad to hear from him on that point.

Dr. F. W. Wright.—I would ask Dr. Leal whether it is proposed to allow the parents of children to visit them at the institution. In a book upon hospitals of this nature it is said that this can be done with safety under certain restrictions.

Dr. C. O. Probst.—I would ask the doctor what precautions are taken by the attending physician to prevent carrying the disease outside, particularly such a disease as smallpox. While visiting the infectious hospital in New York, I was a little surprised at being given a pair of rubbers in addition to a dress that covered me over. I have been attending cases of smallpox for years and have not taken such precautions. I understand that Dr. Edson has been recently led to this by having a case of smallpox develop in this way: The attending physician had visited a smallpox hospital, his shoes were subsequently taken to a shoemaker's shop, shortly after which the shoemaker contracted the disease. This struck me as a good point indeed.

Dr. Wm. C. Woodward.—It may be of some interest to the members to know that in Washington we have had for some time a contagious disease hospital under consideration, but depended upon congress for the necessary appropriation. It will probably be some time before we get one. We have had there a rather unique experience in regard to legislation upon this subject. About three years ago congress appropriated fifteen thousand dollars for the purpose of a site and the erection of such a hospital. The commissioners of the district did what they thought was best and paid practically ten thousand dollars for a site, reserving five thousand dollars for the erection of the best hospital they could for this amount. As soon as it became known that a site had been purchased, there was such violent opposition that proceedings were at once suspended. At present, the site is available, but the money is not. An additional appropriation was made to either enlarge the present site or to secure additional ground. The matter was presented to congress merely in the form of a request for an appropriation, the question of the size of the site came up, and it was presented to them that standard authorities required a distance of at least forty feet, that being the figure given as the maximum limit necessary between outside limits of the hospital grounds and the nearest buildings to the public highway. Real estate men had a different conception of the necessary limits. The result was, that instead of getting an appropriation for a site we secured the passage of a law requiring that no new building should be erected for the treatment of contagious diseases, nor any old building be converted into such a hospital, unless three hundred feet distant from any adjoining building. The estimate upon the basis of that law requires sixteen acres before we can begin operations. With the forty feet limit, we can get it in four acres. The present price of ground practically prohibits us from getting such an institution, unless we secure more liberal appropriations from congress than heretofore.

We have, however, in the course of completion there a smallpox hospital. In this case, an appropriation of thirty thousand dollars was asked for and we secured eighteen thousand. The ground was already available. When this hospital is completed it will be an excellent institution for the treatment of smallpox cases.

Dr. James F. Hibberd.—If the essayist is not already overwhelmed with questions, I would like to ask a question in regard to one point with which we have some difficulty. We have a smallpox hospital that goes by the euphonious name of pest-house. It is considered very disagreeable by persons afflicted with smallpox to go there. It is not occupied by anybody, except in some instances by tramps and persons who come in and are taken with the disease. Within the last year or two we have provided a special diphtheria hospital, with the expectation that where a working-man with a family of children has a case of diphtheria break out in his family, we could offer him the privilege of sending the member so afflicted to this institution to be taken care of without any expense to him, and every provision is made to furnish him with food and other necessaries, but it is not compulsory. Not a single person has been willing to avail himself of the privileges that have been offered. Now, I suppose, even the people of Paterson, New Jersey, will not undertake to invade a private house and take a member of a family to their infectious hospital by force. Presumably an opportunity is offered to any family who has a case of diphtheria, for instance, or other serious communicable disease, to go and occupy such a hospital under certain regulations. The question I would ask is this, Is the feeling in the community where Dr. Leal lives such as will induce members of reputable families without the means of obtaining personal and private care, when afflicted with smallpox, to go to an isolation hospital established for this purpose?

Dr. Albert L. Gihon.—I only wish to supplement what Dr. Woodward has said about the difficulty in Washington, of which I happen to know something. The pitiable sum of fifteen thousand dollars was appropriated for the purchase of a site and erection of a building. This site was selected in the northwest corner of Washington, immediately near residences, and the real estate agents in that corner objected to it on the ground that it was a fashionable quarter, and, therefore, it should not be contaminated by such a neighbor. Then they went to the southeast corner, which was not at all fashionable, and the residents there objected, saying that it was a reflection on them, as they were a poorer class of people, and the health commissioners have tried all four corners without there being anything assigned for this institution. The health commissioners erred in one respect. Dr. Woodward said that we could get along with four acres, but they want sixteen acres, which is little enough. One of the errors of health officers is in asking for too little for purposes of this kind. They ought to insist on having enough. Look at the splendid example we have in the state of Maryland, which gave seven hundred and thirty acres of ground to a new hospital for the insane, and about which Dr. Rohe has written a paper. Seven hundred and thirty acres for a single hospital! Think of it! And given originally by a Democratic governor and carried into effect by a Republican governor. Maryland is a state which is not wealthy, and yet it has made that magnificent provision, and certainly the wealth of the congress of the United States can afford to appropriate sixteen acres of land and pull down all the houses for the purpose of erecting an institution like this.

Dr. Hibberd.—What is the price of the land?

Dr. Gihon.—I do not care what the price is. If it is necessary to have a building put up for this purpose, the work should be done at any cost.

Dr. Hibberd.—There is no necessity for seven hundred acres of land for a hospital.

Dr. Gihon.—The Maryland hospital for the insane, to which I have referred, is the most magnificent in the United States, and perhaps in the whole world. The hospital is one that will never be finished. Dr. Rohe, the superintendent, proposes to put up a group of buildings very much like those of which Dr. Leal has spoken. The idea is a splendid one, and when you see these sick people working on the grounds, getting fresh air and sunlight, you will see the advantage in having so many acres of land.

Dr. Hibberd.—I enter my protest against the idea that it is necessary in the dispensing of charity for eleemosynary institutions to have magnificent buildings. We should confine ourselves to the necessities of the case.

Dr. Gihon.—They are simply very plain two-story buildings, intended for the accommodation of sick people, nothing grand in the sense of display—grand, I mean, only in extent. There is plenty of room. The accommodations are excellent in that respect.

Dr. Durgin.—I want to say a few words on this subject. I believe the only proper place to treat an infectious disease is in a hospital, and every community can better afford to build and keep a hospital empty than to go without it. I congratulate the citizens of Paterson, New Jersey. I want to offer one word of encouragement to Dr. Lindsley, as I have been through a similar experience myself. In Boston, up to 1873, the people were without anything which could properly be called a hospital for infectious diseases. At that time a very serious epidemic of smallpox prevailed, and there was grave fear on part of the city council in deciding upon a locality for such a hospital. In the midst of this danger and perplexity, they appointed a board of three commissioners to take charge of the matter. The board of commissioners were sworn into office about noonday, and within three hours of that time they succeeded in emptying one of the city buildings, fitted it up, and had two smallpox patients in it, knowing that within a few hours' delay an injunction would be served on us. On the second day of the use of this building, Judge Colt, the man selected to serve the temporary injunction, was taken by us to the same building with smallpox from the Tremont House. This having been done, there was no way for an injunction to be served, because we could not be thrown out. The city became a very willing victim for an appropriation. I might say, by the way, that the ex-mayor, who lived by the side of the building, about two hundred and fifty feet distant, vacated his house, boarded up the windows, and went on board a little steamer, sailed down the harbor in a storm and was drowned. It became very easy to get an appropriation to purchase four acres of land in a first-rate spot and to build a magnificent hospital. I hope Dr. Lindsley will have as good experience.

Dr. Woodward.—I enter my protest against a contagious disease hospital, or lunatic asylum either, being regarded as charitable institutions. I think they are by no means charitable institutions. In one case, it is purely a sanitary institution, while in the other, it is a police institution. I do not believe they should be classed as charitable institutions.

Dr. Alfred A. Woodhull.—While I was in London some three years ago, I took pains to investigate what is known as the fever hospital. I mention this because it will answer some of the questions pertaining to matters of this kind. In one of the suburbs of London in a very populous district, which is practically in the country, there is a fever hospital, and it is devoted entirely to scarlet fever and diphtheria. It is my impression that measles is not regarded as a contagious disease under these circumstances, not that they deny the contagion, but they do not think it is of sufficient importance to convey patients to such a hospital. Smallpox cases are treated in other hospitals suitable for them. What I was about to say concerns the nurses of that hospital. The physicians told me that they were allowed to go out on certain days to visit their friends and neighbors, after taking a bath and changing their clothes. How thorough the bath is, or how particular the women are to cleanse their long hair, and how careful they are about their apparel, I do not know, but my impression was that they were not particular about these things. Relatives and friends of patients were allowed to come to visit them on certain days, or when they were very ill or *in extremis*, after changing their outer clothing in an anteroom and putting on a hood or woman's waterproof. They allowed me to go into the smallpox and scarlet fever wards and out again without any special precaution. I have never had scarlet fever, and I was quite glad to get out after I had looked around a little. I took no precaution, nor was it required of me. I suppose my professional capacity was considered a sufficient safeguard.

As to the class of patients admitted, they require, as I understand, those who could not to the satisfaction of the health authorities be disinfected at home without requiring them to be taken to the hospital. Those who desired to go were permitted to do so, and they mentioned with a great deal of satisfaction that a physician sent his child there who was taken with scarlet fever. Another physician had also sent a physician there. The hospital was certainly not more remote than across the length of a street from houses, and I was given to understand that the people in the neighborhood were not disturbed by its presence. The grounds were very large about it, while the buildings were one-story pavilions.

Dr. A. N. Bell.—I have recently had occasion to carefully look up the matter of contagious disease hospitals and their locations. The most recent treatise on the subject, with which doubtless many of the members are familiar, is by Stevenson and Murphy, who have covered the question thoroughly, and according to the evidence which they bring forth, based on the researches of a great many men connected with the local government of London and the Sanitary Institute of Great Britain, there is practically no danger of the contagious diseases being communicated from these hospitals except smallpox. In other words, other contagious diseases, including typhus fever, do not spread across a street a hundred feet wide, and there is no reliable evidence that they have ever done so. On the contrary, it is common in the vicinity of a smallpox hospital, say half a mile distant, for that disease to be communicated. In short, the danger comes through the communication of things, through trade with these institutions, and the want of sufficient executive watchfulness in the transportation of materials. Almost everything, we might say, including the building itself, will retain the contagion of smallpox for a long time, if not taken care of and the contagious disease patients taken out. I can recall instances in my own experience with regard to contagious diseases, some of which are surprising. But truths in science are never too old to be cited with benefit. I know of an old surgeon of the navy, Dr. Johnson, who died in Charlestown, Mass., a few years ago. He came home from the coast of Africa, bringing with him a trunk of books. He had treated cases of yellow fever on the coast of Africa. He packed up his books prior to leaving Africa, and when he came home he took his time in unpacking them. I think he waited some three months before he took the books out of the trunk, and shortly after he did so he was stricken with yellow fever and came near dying. This was about forty years ago. The late Dr. Elisha Harris and myself traced every single case of yellow fever that occurred in the cities of New York and Brooklyn during an epidemic which prevailed at the time. On Long Island shore there occurred some sixteen cases, every single one of which we could trace to some article,—such as old boots, old hats, etc., which carried the contagion.

In regard to extreme distances for the location of contagious disease hospitals, we should require distances that are practical. We do not need great plots of land for such institutions. Insane people and insane asylums need agricultural grounds ; they need farms. This class of people is not going to communicate disease. It is necessary also that they should have proper exercise. We may do the same for epileptics, establish epileptic colonies and similar institutions. These institutions require larger areas of land, but not so with hospitals for contagious diseases. These institutions should be located within a reasonable and readily accessible distance. If you take a person with a contagious disease a mile or two away you will make the parents of that patient frantic. They want the child near by.

Lastly, in regard to the application of steam as a disinfectant. I believe the steam is the best thing to use. It will penetrate where no other disinfectant will go. I have found steam whose temperature did not exceed 145° very effectual so many times that, if I can get it, I would rather have it than any other disinfectant. Do not insist upon doing an impracticable thing when steam is within easy distance.

Dr. Leal.—I think the first question asked was with reference to the disapproval of neighbors. Our site comprises about twenty acres of land. This land was already owned by the city, and in about the same location as our new institution was the old pest-house, which had been there for forty years. The land company in the immediate neighborhood went to five lawyers of my acquaintance and tried to get an injunction. How many others went, I do not know. We practically had no trouble about that.

As to the restriction of inmates, they are divided into several classes, that is, the regular working force of the institution, which at the present time is composed of a keeper and matron and two men. Now, it is expected that whatever additions may be added to their number, these four people will not be exposed to infection in any way whatever. It is our desire to protect the regular working force of the hospital from infection just as much as we try to protect the public from it. Another class would be the nurses. The nurses, as I told you in my paper, are secured from training-schools. They serve for two months, and during that term they live in the pavilion while they are on duty. They can only leave the pavilion for the exercise which is necessary to their health, and a certain section of the grounds is laid out for the use of nurses in each pavilion. A nurse can only enter those grounds which belong to her pavilion for exercise.

A third class are the patients. They are allowed to see no visitors whatever. No one is admitted to the institution under any circumstances, except the father of a child. When a patient is sent to the hospital the privilege is extended to his or her nearest friend to accompany such patient. For instance, a patient can be accompanied by the father, sister, brother, mother, or grandmother. Any member of the family may be selected to accompany the child to the hospital. The husband is permitted to accompany the wife, or vice versa. No one else is admitted under any circumstances whatever, except in case a child be sent without an attendant and is not dangerously sick. If the child should be dangerously sick, we admit the nearest friend. Once admitted he or she, as the case may be, must remain there until we are through with him. We quarantine him.

The next question is with reference to the medical attendant. We have appointed a physician of good standing in the community, who has charge of the hospital and everything which pertains to the medical care of patients. He has supreme authority in this regard. I have no authority over him whatever as regards the medical care of patients. He visits patients as often as he deems it necessary, and he is the only person admitted to the ward and allowed to go out. When he enters the institution, he is given a sterilized gown, which includes a hood that has a draw string. This is drawn tightly over his face, leaving only his eyes and mouth exposed. It is so arranged that it can be drawn tightly around the ankles and completely cover the physician. He is furnished with prepared rubber canvas-coated boots, and the string of the gown is tied tightly over the boots. When he goes into one pavilion and does his work, as he comes out the disinfectant room is ready for him. He changes his gown, goes out on the corridor, and goes through the same arrangement. If he goes into three pavilions, he puts on a fresh gown every time.

Dr. Plunkett.—You spoke of disinfecting the physician—what with?

Dr. Leal.—I should have said bichloride.

A Member.—Suppose the physician has a beard, is it disinfected also?

Dr. Leal.—If he has a beard he would have to wash it thoroughly.

Dr. Carter.—Are the clergy admitted?

Dr. Leal.—Yes. They are admitted on the same footing as the physician. Protestant ministers and Catholic priests have the same privilege as the physician. But they have to go through the same preparations.

Dr. Lindsley.—Is the patient allowed to employ his own physician?

Dr. Leal.—That is another point. A patient who is willing to pay for a private room has the privilege of such room and also the privilege of employing his own physician, provided he meets with the approval of the attending physician, and said physician is subject to the rules and regulations of the institution. The private physician must be paid by the patient. The patient may have a special nurse under the same conditions, but that nurse and physician must conform to the rules of the hospital, and are under the authority of the attending physician.

As to the point of moist atmosphere, we have thought of that, and it is provided for by a special escape arrangement which always gives us a moist atmosphere.

The important point is to force patients to enter the hospital. We have authority in New Jersey to force any victim of contagious disease whose presence in the community may be a menace, to enter the hospital provided for that purpose. We force all cases of smallpox to enter the hospital. Public sentiment, however, will hardly support us in that stand regarding diphtheria and scarlet fever at the present time. Our idea is to force any person into the hospital who has not a home, particularly those persons who are taken sick in a hotel or boarding-house. We remove those persons without any ado about it. The cases we are after are those which occur in tenement and apartment houses. There are far more of that class than the other. These are the patients we want in the hospital. We allow no one who is exposed to go to his work, etc. We believe that it is only a short time when people generally will see that it is to their interest to have patients with smallpox removed to this hospital.

Dr. Hibberd.—In Indiana we quarantine the houses, keep all the members of the family from work and from out-door exercise, and still they prefer that to going to a contagious hospital.

Dr. Leal.—Do you keep them in the house?

Dr. Hibberd.—Yes, and we feed them well.

Dr. Leal.—This hospital has taken nearly a year to build. It has had the backing of the intelligent element of the community and of the newspapers, and a very favorable sentiment has been worked up about it. At the formal opening of the hospital, which took place about two weeks ago, we had in a pouring rain over two thousand people to inspect the institution and listen to the addresses, all of which goes to show the interest the people are taking in it. I have been told by a large number of educated and refined ladies who have visited the hospital that if their children are taken with contagious diseases at any time they will send them to this hospital. That is the sentiment which prevails among the intelligent people of the city. We have no trouble with them, but if we have any disturbance it will be with the lower classes.

I have spoken of disinfection of the physician, which consists in washing himself entirely with bichloride solution. I know of no other means that is better or as easy as it for personal disinfection.

You will understand from what I have said, how each building is constructed. The flues are all arranged so that they can be closed. There is a system of dampers in the rooms which are operated in the attic. It closes every flue leading from that building. The inlet flues can be closed in the same way. We have double windows and double doors. We can shut the buildings up tight, and we can get the pressure of steam on those buildings. The building will stand one-quarter pound of steam pressure. The pipes and radiators are so arranged that we can turn live steam into the buildings. We sterilize the building just as surgical dressings are sterilized in the old-fashioned tin sterilizer, but we can get more steam pressure inside the buildings than you can get in one of the old-fashioned sterilizers. Besides, after removing clothing, etc., which all goes through the sterilizer, we can turn the hose on the ceilings, walls, and furniture and there is nothing to hurt. Everything can be thoroughly flushed. Then we turn on live steam and steam it thoroughly. After that, we have a pump which throws a spray of bichloride solution. It is a spray which will extend its radius about six feet, a very finely-divided spray. This is used all over the building, so that with this finely-divided spray every nook and corner of the buildings are sprayed with 1-1000 bichloride solution. This is our system of disinfection. As you will understand from the paper, we depend upon this so thoroughly, aided by the construction of the buildings, that we do not set aside either one of the buildings for any particular disease whatever. We use it for any purpose. When through with it we thoroughly disinfect it; then it is ready for anything we may need in the future. We may have cases of smallpox one month, and diphtheria cases the next month. So we depend upon disinfection entirely.

As to the different kinds of disease admitted, we will admit any kind of disease that we are forced to take, or that we think it best to take. The hospital is built mainly for cases of scarlet fever and diphtheria. We have some cases of smallpox, but they are comparatively small in number. They are always brought in from the outside, and are isolated cases. If a patient suffering with measles has no home or is poor we take that patient. If a case of erysipelas should develop in a house where there was a surgical case at the same time, we would also take that patient. Under other circumstances we would not. We do not admit typhoid fever cases, as there are two general hospitals in the city suitable for that class of patients.

A Member.—How far is the hospital located from the centre of the city?

Dr. Leal.—At least one eighth of a mile.

Dr. Lindsley.—Have you ever found it necessary to carry a patient more than three miles to reach the hospital?

Dr. Leal.—Yes. It might be necessary to carry a patient a distance of five miles.

Dr. Plunkett.—Do you carry them in an ambulance?

Dr. Leal.—Certainly. A word or two more, and I have done. We do not regard this hospital as completed. This is a beginning, but we do claim that it will be just as useful in the future as it is now. We have built nothing to tear down.

JOURNAL

OF THE

American Public Health Association.

ANNUAL VOLUME, NO. XXII. JULY, 1897. QUARTERLY SERIES. VOL. 3, PART 3.

The American Public Health Association is not responsible for the sentiments expressed in any paper or address published in this Journal.

PROPHYLAXIS OF PALUDISM.

By ALFONZO RUIZ ERDOZAIN, M. D., Hidalgo, Mex.

The malaria of the Romans, the modern paludism, a universal complaint that prevails in all parts of the world, was well known in Greece and Italy, and was afterwards discovered wherever civilization carried its conquests; it has been the advanced picket that has delayed or stopped civilization; but the prudent Hygeia will, like another Theseus, break the hydra-head of the spirit of the swamps.

In inter-tropical climates, in the low-lying lands where the soil is damp and permeable, and where deposits are formed of the waters, forming lagoons, lakes, and swamps, and along the seacoasts, river banks, etc., during those seasons of the year when the surface of the water is exposed to the atmosphere and the heat of the sun, and when they are more or less dried by evaporation and their level lowered, the seed of the palutic proteus germinates, that is now called the enterozoa discovered by Laveran.

In some parts it is only necessary to pass the spot in order to be exposed to the pestilential emanations and acquire the disease; but in others, the moving of the soil, whether for agricultural purposes, or for the construction of canals, railroads, or fortifications, presents an opportunity for the entry of the disease; and thus it is that colonists, soldiers on an expedition, and other such people, are those who have paid the largest tribute to malaria.

The prophylaxis of paludism is a question of great importance, and the observance of its precepts neutralizing or diminishing the exaggerated fear with which we regard those places of undesirable fame, will bring about the increase of immigration to them, so that by cultivation and sanitation they will be converted into a real paradise to man.

The means for realizing the prophylaxis have been well known for many years; but sometimes the ignorance, and at others, the carelessness or apathy of the people, have led to inconstancy in their application.

The principal rules are three: Firstly, it is known that in any swampy region, there is a good and a bad season,—one in which the fevers develop, and another in which they decrease or disappear, for which reason it is necessary to select the latter for arrival in the locality or for traveling in malarial regions;—secondly, all diseases by preference attack individuals who are weak through their constitution, their age, or their excesses; for which reason, persons ought to be selected for expeditions or to work who are robust, strong, and young, preferably those who have not suffered from fevers of this class, as it is well known that one attack predisposes to another, and that the true acclimatization for paludism does not exist, according to Laveran; although a person who is acclimated in hot countries, suffers less fatigue, and is not so accessible to the acute forms of the disease; thirdly,—that as the turning of the soil places the individual in immediate contact with the telluric germ, and as those tasks are laborious, and physical fatigue predisposes the foreigners, they should not at once enter on this class of work, but rather allow it to be executed by the natives of the place, such as negroes, and people of the Yellow race, who can resist a great deal better than the whites, although they do not enjoy an absolute immunity. The works on the railroad across the Isthmus of Tehuantepec, on the Panama canal, and in Tongking, show that the laborers are those who present the greatest resistance.

The real prophylaxis ought to be considered from two different points of view: The individual and the general. As the latter cannot be at once put into practice, it has to take the place of the first, which is the most important, because we require stout and well-trained men, who, after opening and establishing communication will continue preparing the ground so as to cultivate and render healthy those places in the hot country from which we export the golden grains of Coffea Arabica, the golden leaves of tobacco, and where we cultivate the rubber, the sugar-cane, and the many rich and agreeable fruits that are found in that land of commerce.

The individual prophylaxis consists of the combination of measures which are intended to preserve the individual from the attacks of paludism, and the general prophylaxis consists in studying and putting into practice, the appropriate means for converting the paludal regions into a habitable country.

Paludism, under all its forms, from the simply intermittent or remittent up to the most serious attacks, such as pernicious fever, is occasioned by the introduction into the system of the micro-organisms which Laveran discovered, and which, penetrating into the circulation, affect the blood globules, bringing on a special kind of anaemia, that is shortly followed by a profound cachexia. The infection mostly comes through the respiratory organs, through the digestive apparatus, and at times from the surface of the skin through the bites of mosquitoes that abound in swampy and lacustrine districts.

The individual prophylaxis is limited to observing all the rules for preventing the germs from penetrating into our organism; the general prophylaxis, in preventing the production of those germs, by draining the swamps, lakes, or lagoons, and by the methodical sanitation of the ground, which, although certain and easy in theory, presents great difficulties in practice.

Individual Prophylaxis.—In order to prevent the pathogenic germs from penetrating by way of the respiratory channels, the use of masks made of wire and cotton has been recommended; but the use of such things is very uncomfortable for working people, although they may be useful in certain special cases, and may be arranged in such manner, that permitting the inspiration only by way of the nostrils, they may leave a way open for expiration through the mouth. The true prophylaxis of paludal infection rather consists in the application of a series of hygienic measures which are easily practicable. The selection of a site for a dwelling-house is of the greatest importance, even in the good season; it ought to be built on elevated ground, where it will be free from fog, as the malarial germ is as well developed in the vapor of water, and perhaps more than in the dangerous neighborhood of the swamps, according to the observations of Dr. Nicolas.

Another desirable precaution consists in abandoning the paludal region before sunset, and not returning on the following day until it has been sufficiently warmed up, as it is known that the germs rise with the atmospheric strata whenever they are heated, and sink when they are cool. Never sleep uncovered, or be out of doors during the night in those regions. The water which is used for drinking, cooking, and even washing, ought to be filtered in special apparatus, such as those of Chamberlain or Pasteur, or if these are wanting, it ought to be boiled; because in spite of the fact that we do not know under what form the palustric parasite enters into our system, it is probable that it penetrates with drinking water, like the cholera bacillus, and the typhoid bacillus, and that it is absorbed through the digestive channel. The question is still under discussion, but until it is decided, it is necessary to prohibit the use of water without boiling, either for drinking purposes or for washing or bathing. Certain facts appear to support this belief in the contaminating properties of water, and instances have been seen in which the evident cause of the first attack of paludal intermittent fever, has been the drinking of water from a specific well, which had acquired a local reputation as the origin of the attacks. In other cases, we know that the disease has been avoided by using, during the whole stay of a person in a place where paludal intermittent fevers prevail, of a good class of water, which was carried by the travelers themselves. It is also advisable to mix permanganate of potash with the drinking water, as it purifies the water, and is very strongly recommended by Dr. Langlois, after his recent very interesting experiments. By adding five centigrams per litre of water, we obtain the destruction of all organic and organized matters that may be contained, and the water can then be drunk without any danger whatever, even though taken from some swamp, as that salt acts on the figured elements and even on the toxins, entirely destroying them.

The food must be of a tonic character, and easy of digestion, with a moderate use of condiments and alcholic liquors. It is necessary to chew the food thoroughly, and to take tea and coffee, which have the advantage of being prepared with boiling water; the drinking saloons ought to be carefully watched, so as to prevent the consumption of adulterated liquors or those of bad quality; people ought not to go out in the morning without breakfast, and ought to eat everything hot, if possible close to a fireplace.

The articles of clothing ought to be easy fitted, and such as to protect the body from the solar radiation and keep it up to a moderate tempera, ture, favoring the compensating evaporation, which goes on over the surface of the skin, whilst at the same time avoiding chills. The use of a flannel waistcoat, woolen or cotton shirt without starch, flannel jacket and trousers, high boots for work and for traveling, low shoes for daily use and a palm-leaf hat, with wide brim and high crown, will be found of great advantage, as the most appropriate dress for these districts.

People ought not to go to bed with the body entirely naked, or with the doors and windows open, whilst the bed ought to be covered with mosquito bars.

Bodily fatigue ought to be avoided as well as excesses of all kinds especially with alcoholic liquors and others of that class, which weaken the system and render it impressionable to paludic infection. A precautionary treatment ought to be instituted by means of salts of quinine, administered in doses of one-half to one gramme per day, with interruptions of one or two days, as these are more successful than the small doses that have been recommended. Thorel, Bizardel, and Groeser, Batavia, Cezary, Barthelemy, and Nicolás, have successfully prevented the disease from attacking the persons under their care during the expeditions to Me-Kong, Cochin China, Algeria, Dahomey, and Panama, by administering small doses of sulphate of quinine, which have acted as fine tonics, and have enabled the individual to resist infection, or at least avoid the more serious forms of impaludism. Arsenic has also given very good results, but not better than quinine.

Duing the season that is favorable to fever, and which generally comes at the beginning or end of the rainy season, it is desirable to make the people live on elevated spots, or where they are protected by trees from the winds which pass over lacustrine districts and carry the germs.

General Prophylaxis.—The labors undertaken for the sanitation of the whole of Europe and part of America, are fine examples of human power, whilst the struggle of the Dutch with the sea, the sanitation of London, the works undertaken on the banks of the Rhine, and of the hill near Strasburg, and the cultivation of the swamps in Bologna, Tuscany, Hungary, and Algeria, have changed the face of the country and the future of the nation. The drainage and canalization of the waters, the sewers, the cultivation of the soil, the plantations of trees, which, like the Ficus, the Laurel, the Pine, and the Eucalyptus, protect the surrounding country from the malaria, and absorb great quantities of water, to be afterwards returned through their leaves in the form of vapor, combined with their aromatic and antiseptic perfumes, are the means which ought to be undertaken to suppress the evil at its source. All the species of Eucalyptus, especially the *Rostrata*, which is a hardier plant and easier to cultivate, as well as of rapid growth, drain the soil, and are capable of forming enormous hedges impenetrable to germs.

In the city of Mexico, which was formerly surrounded by immense lakes, with its porous soil that is thoroughly impregnated with water, paludal fevers used to be frequent; but they have now decreased to such a degree, that some physicians practising in that city no longer believe in their existence, an improvement that is undoubtedly due to the drainage of the lakes of Texcoco, Chalco, Zumpango, and San Cristobal, as well as to the cultivation in the surrounding country of an immense number of Eucalyptus trees, which, during the last thirty years, have been planted in the neighborhood of the villages and the valley in which it is situated. The drainage works of the valley, and the canalization of the waters of its springs, will soon be an accomplished fact, and the disappearance of paludal fever will then be a fact susceptible of proof.

PALUDISM IN THE STATE OF MORELOS AND ITS PROPHYLAXIS BY SANITARY MEASURES.

By DR. ANGEL GAVIÑO,

Professor of Hygiene and Bacteriology in the School of Medicine, Delegate from the State of Morelos, Mex.

If the study of therapeutics, which in its continued progress every day snatches more victims of infection from our tables of mortality; if serotherapy, in rising victorious from the arteries of animals, stops the desolating progress of the most serious diseases, and may shortly be found to constitute an absolute preventative; hygiene, with its general rules, with its universal precepts, saves and protects not only the isolated individual, not only the family that lives under one roof, but it also saves humanity in general, in entire communities.

For these reasons, sanitary measures, when applied with intelligence and energy, give such marvelous results. Hygiene, acting on the soil, the water, the dwelling, prepares the soil on which man lives, and at one blow avoids infection or erases it from the list of those which predominate over a region.

The natural riches of the state of Morelos are simply incalculable, seeing that it disposes of an enormous amount of water throughout its whole arable surface, and has a climate that is generally torrid, as in many places we find a temperature of 30° or 35° C., and I myself noted a temperature of 36° in the shade at the end of April, and a little to the south of the town of Jojutla.

These climatological conditions render that state favorable for the cultivation of sugar-cane, rice, plantain, and coffee, and, as is well known, these plantations require a great deal of water in the form of irrigation, and thereby transform the fields into enormous swamps. As the greater part of the centres of population in that region of the Mexican republic are of an agricultural character, all towns are surrounded by plantations of the character indicated, and they are therefore enclosed in an atmosphere which is highly impregnated with malaria. In fact, the inhabitants of those tropical and fertile regions are pale, anæmic, and during certain parts of the year are subject to accesses of paludism, of more or less intensity.

People who are foreign to that state, and who remain there for a long time, are generally infected about the second year of their stay, and the infection generally manifests itself during the rainy season, in July, August, and September.

I have made many visits to the state at different periods, and in a hot and swampy district, such as that of Jojutla, and 960 metres above sea level, I have had opportunities of observing the paludic infection under very varied forms. I have found that the daily and tertian intermittent form is very frequent, whilst the ordinary remittent form is less frequent, often presenting the disease in a nervous form, an intestinal form, and sometimes with very serious symptoms.

Pernicious Form.—This is not very frequent in the northern district of the state; it is commoner in the lowlands of the south, and especially in those places where swamps are frequent. In various cases that I observed, only once did it present itself in the algide form, and in six cases I found it in the cerebral form. Sometimes it presents itself in a pneumonic form, characterized by the appearance of hemoptic esputa, stethoscopic symptoms of catarrhal pneumonia, intermittence and fugacity in the appearance of the accesses, which was cured in a short time by the application of sulphate of quinine.

Amongst the anomalous manifestations, I may mention paludic dyspepsia, which is common amongst persons who are not acclimated, and disappears on the exhibition of quinine; intermittent paludic rheumatism and neuralgia of the trigeminus nerve, gastralgia, hypalgia, etc., which also cede on the administration of quinine and arsenic.

The chronic and caquestic forms are very frequent, as that town can really be said to be profoundly contaminated with paludism. Splenomegalia is frequent; I saw a young man on one occasion who was employed as fireman on a sugar plantation, and whose spleen was so large that it almost entirely filled up the abdominal cavity. This case can only be compared to that of another young man in the state of Vera Cruz, whom I saw in company with Dr. Carmona y Valle, and who suffered from the same enlargement. These two cases of splenomegalia are really worthy of an anatomo-pathological museum.

Clinically speaking, these infections have been known as paludic from time immemorial; in fact, they present all the classical indications which are known to pathologists, such as the morning access, at 11 a. m., strong chills, fever, perspiration, pains in the muscles, cephalalgia, anorexia, great weakness, characteristic paleness, etc. There can be no doubt as to the nature of the disease, but science to-day is not satisfied with this simple knowledge; it requires to ascertain its real character, and thoroughly investigate the Laveran infection, which is characterized by the hematozoa, or to distinguish them microscopically by studying their hematology.

Of twenty-three cases, which I studied at different times, I can give an exact description.

In general, there is a highly anæmic condition, with a very much enlarged spleen.

Average number of red globules	3,600,000
Hemoglobina, by Flesche hematimeter, average	61
Real quantity	9.1

The microscopical observations were taken :

1. Before the access	11 cases.
2. During the access	4 "
3. After the access	5 "
4. Persons come from Morelos to Mexico, and observed by myself	3 "

In nine cases of the first group I found colored spherical bodies, and in three of them I found semilunar bodies. In the other two cases of the first group, I could only observe pigmentary granulations in a free state, and a few melaniferous leucocytes.

Of the second group, which was observed during the access, I found in two of the patients, colored spherical bodies, and in one of them, long, stringy bodies, whilst the other had a great quantity of young spherical bodies, which were adhered to the red globules. With this latter patient, the accesses lasted very long, and resisted quinine by itself, only ceding after it was associated with arsenic.

Of the third group, observed after the access, in three of the patients I found colored spherical bodies and free pigment.

The other two had taken strong doses of quinine; one of them presented colored spherical bodies in a small quantity and very remarkable "rosacea;" the other had no hematozoa, and only a very few leucocytes, very poor in melaniferous granulations.

Of the fourth group, observed in Mexico and after the access, one of them, who had an enormous splenomegalia, presented a great many small, colored, spherical bodies, which had penetrated or adhered to the red globules. This case was cured with quinine, arsenic, tonics, hydrotherapy, and a stay in the city of Mexico, at 2,265 metres above sea level, and with a mean annual temperature of 15° C.

The other two patients only showed free pigment and a very few melaniferous leucocytes.

I have observed many other cases in the state of Morelos which clearly demonstrated the presence of hematozoa, but I, unfortunately, took no note, and I have not a sufficiently exact memory of the cases to insert them in this paper.

The time of year when paludism appears, almost under an epidemic form, is that of the heavy rains. The causes which originate its appearance are the turning up of swampy soil on a large scale, for the purpose of cultivating the rice and sugar-cane, and also, perhaps, the great impurity of the drinking water, to which cause I also attribute many of the infections that are found in that state, such as dysentery, interlineal septicemia, infantile diarrhœa, and paludism.

PROPHYLAXIS.

As the most efficacious sanitary measures against paludism, we may indicate:

1. Drainage of the swamps and cultivation of crops that do not require any extensive superficial irrigation.
2. Canalization of the waters.
3. Drainage of those lands where the subterraneous currents are at slight depth.
4. Prohibition of the cultivation of rice, sugar-cane, etc., in the immediate neighborhood of the town.
5. Filtration of the water.

In the region situated to the north of Jojutla, Morelos, in the Hacienda of Zacatepec, an intelligent engineer called Felipe Ruiz de Velasco has carried out a drainage system over an enormous area, and has obtained, in the first place, the drainage of immense swamps, and splendid crops by the cultivation of sugar-cane; and, secondly, a considerable decrease in the impaludism amongst the laborers who work on his grounds.

The Morelos Board of Health, which is formed of learned physcians, who thoroughly comprehend their important mission, observed that the villages and towns round which rice was cultivated suffered much more than others through paludism, and appealing to the government of the state, which does not spare any effort in its pursuit of the prosperity of the people, the board was enabled to enact a rule or law, which the government placed in force, ordering that no rice should be cultivated within a radius of 2,100 metres from any town. The advantages of this well-considered regulation have already made themselves evident in the town of Jojutla, as well as other smaller places, where it has been brought into force with the most encouraging results.

DISCUSSION ON THE PAPERS OF DRS. ERDOZAIN AND GAVIÑO.

Dr. David Cerna.—I have been very much interested in the reading of the last two papers, and desire to corroborate every statement made in the last paper. I have practised for several years in a malarial district, and find all the cases are practically the same.

In regard to the prophylaxis, I agree with the readers of the papers that what they have said in regard to paludism is absolutely necessary. But sometimes in many of these regions where we try to carry these measures into effect, where there is a lack of either good local government or of funds, we cannot do so. In fact, in the region where I live, the people are very poor, and in such cases we must find other means of prophylaxis. A change of scene is among the best. I have found in many cases of obscure paludism that sometimes quinine and arsenic will not effect good results. I have said to myself that this is because it is possible for the disease, which I believe to be a paludal disease, not to be paludism; it is not malaria. Sometimes I have been enabled to examine the blood with the microscope and find the malarial organism. In other instances I have been unable to find organisms. When we find the Laveran organism, we are sure it is malaria. In those cases where I have found the malarial organism, and in which quinine and arsenic did not rid the patient of the disease, I have used another drug which acts very efficiently, and that is phenacol. It is one of the best anti-malarial fever remedies we have. I have found that quinine and arsenic failed in some instances, and when phenacol has been given it has prevented attacks of paludism. I give it in from 5- to 10-grain doses, three or four times a day. At the end of four or five days the disease is cut short.

One point in reference to malarial districts, and it is this, that it is difficult to diagnose malarial disease even with the microscope. All of us are not expert microscopists, consequently we sometimes deceive ourselves. It is difficult to diagnose malarial disease. I have entertained this idea in those districts in which malarial disease is frequent. In these places we find doubtful cases that we cannot diagnose. After excluding the eruptive fevers, and perhaps the pernicious fevers, I have found that if the case is not of malarial origin, we can say as a rule, almost without exception, that it is a case of typhoid fever. In those cases, you think you have the symptoms of malarial disease. The patient has chills, a hot and sweating stage, pains in the muscles, and enlargement of the spleen, and even when you give quinine and arsenic and phenacol, the patient will go on suffering with fever. Those doubtful cases are nothing more or less than typhoid fever. Typhoid fever is not a disease which is characteristic, because sometimes the most essential symptoms of the disease are absent. You do not get the characteristic temperature of typhoid fever, and therefore cannot diagnose such cases except at the post-mortem table.

SANITATION IN HOSPITALS FOR THE INSANE.

By GEORGE H. ROHÉ, M. D.,

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The sanitary problems involved in the management of an insane hospital do not differ essentially from those governing general hospitals. The same principles of food and water-supply, drainage, sewerage, the prevention of the spread of infections, and of personal hygiene are applicable alike in both classes of institutions. This is, perhaps, not generally recognized, even by those in charge of the insane. In too many instances, the water-supply and bathing facilities are insufficient, water-closets and night vessels are kept in sleeping rooms, the disposal of sewage is not in keeping with modern sanitary requirements, little care is taken to limit the spread of infections, such as tuberculosis, and in the food supply, economy is considered a greater excellence than the nutritive character of the food furnished.

In the construction of hospitals for the insane, too much attention is directed to what are believed to be points of difference between insane and general hospitals. As a matter of fact, the nearer an insane hospital ward approaches the general hospital ward in arrangement and administration, the better it serves its purpose.

It is a tradition handed down from the fathers, that the acutely insane, the so-called "disturbed" and "excited" cases, must be isolated and removed from contact with other patients of the same class. The excited, maniacal patient is usually brought to the hospital handcuffed, or otherwise fettered. He is placed in a darkened room with barred windows. If he is destructive, or suspected to be so, the window is protected against breakage by an inside shutter or screen, the furniture is removed from the room, and the mattress is placed upon the floor for a bed. The door is then locked and the patient looked after, perhaps, once in two or three hours by the attendant, and two or three times a day by the physician. In the meantime, the patient does not lie down on his mattress and go to sleep, as he is expected to do, but divests himself of all his clothing and tears it to tatters; he rips up his mattress and scatters the straw about the room; he shouts, sings, laughs, storms around, beats against door, walls, and window screen, and otherwise exhausts himself. He refuses food when offered him, and is then fed forcibly by means of a duck or a stomach-tube. Little attention is paid to his secretions or his digestive capacity, and in the course of a few days he becomes worn out and dies of physical exhaustion, or of some intercurrent disease, such as pneumonia or erysipelas. In other cases, his tendency to destroy property is limited by mechanical restraints in the form of muffs, camisoles, or bed fetters of various kinds. The results of these methods of treatment may be found in the column headed, "Death from exhaustion," in the reports of so many insane hospitals and asylums. Personal observation has taught me that, with few exceptions, they do these things no better in other countries. I desire to say, also, that better methods prevail in many of the modern state institutions in this country.

Experience is teaching the alienist that the most acutely maniacal patient can be better and more humanely cared for, and that he becomes quiet and docile sooner, if placed in bed in a well-ventilated and lighted ward, surrounded by other patients, and nursed by trained attendants. The force of example has power even over the disturbed mind, and the patient readily begins to realize that all this care is taken of him because he is sick. So soon as this notion takes root in his mind, he more or less willingly yields obedience to his physicians and nurses. With the more general adoption of the name "hospital," instead of "asylum," as a designation for institutions for the insane, the idea is gaining ground among the laity that insane people are sick people, entitled to the best medical treatment that can be furnished; and not wild and dangerous beings, required, for their own and others' safety, to be restrained behind strong walls, locked doors, and barred windows. The "keeper" and "guard" have already given place to the "attendant," and the latter is rapidly passing away before the trained nurse.

As the pavilion plan of construction has finally been settled upon as the most desirable for general hospitals, so the same system, albeit known as the "cottage plan," is generally accepted among alienists as the best for insane hospitals. Here, simplicity of construction, large air-space, abundance of sunlight and free ventilation, safe heating and lighting apparatus, and adequate protection of the patients against danger from fire, are the main objects to be kept in view. Economy and convenience of administration are, of course, important, but secondary to the foregoing.

No buildings for the insane should be over two stories in height; if financial conditions permit, one-story buildings are preferable. Dormitories and day rooms should be separate. Every room occupied by patients should receive direct sunlight during a portion of the day. Through ventilation by windows placed opposite each other is preferable to mechanical systems of ventilation.

I have recently seen, in one of the most modern hospitals in the United States, wards with windows only on the north side, never admitting any sunlight, and many of the beds placed directly under the windows, subjecting the occupants to the dangers of cold descending currents of air from the window surface. This was partly due to overcrowding of the ward, but partly, also, to incorrect construction.

There can be no question that the most sanitary artificial light is the incandescent electric light. There is no appreciable heating effect, no deterioration of air by the products of combustion and withdrawal of oxygen, and the dangers of fire from this source, accidental or designed, are absolutely avoided.

Fire escapes should be required in all hospitals, but here the skeleton iron ladders on the outside of the buildings are far inferior to a solid, broad stairway, constructed of non-inflammable material. This should be used frequently as a means of egress, so that the patients will become familiar with a route which may require to be traveled in great haste and amid excitement and confusion. The fire stairs should be the shortest way out of the building.

The water-supply must be liberal. One hundred gallons per day per head is abundant, but not excessive. Insane persons require frequent baths, and for nine tenths of them the spray bath, first introduced into insane hospitals in the state of New York, is the most desirable, because it insures to every person bathed a supply of clean water.

The methods of removal of excreta and other sewage are susceptible of improvement in most of the institutions I have seen. In many of the older buildings, the water-closet, urine pail, or night vessel is still an article of furniture in the patient's room. This can in no sense be regarded as a sanitary arrangement. Patients who are able to get about should be required to go to the toilet room during the night, as well as in the daytime, when responding to the calls of nature. Bedfast patients, of course, require the attention of the nurse at all times, to prevent soiling of the bed. Experience has shown that intelligent coaching by a careful nurse or attendant reduces to a minimum the use of night vessels in single rooms and dormitories. The automatic flush closets, so wasteful of water and so constantly getting out of order, can be dispensed with. With careful supervision and some pains devoted to instructing the patients, even advanced dements readily learn to use the ordinary chain pull to flush the closet.

The ultimate disposal of the sewage should be, wherever practicable, by surface or subsurface irrigation. Most insane hospitals possess sufficient land for this purpose. It is not necessary to carry the sewage a great distance from the buildings. At the Maryland Hospital for the Insane, where the sewage is disposed of by surface irrigation, according to specifications furnished by Colonel Waring, the disposal field is within two hundred feet of the main building, and the collecting tank within thirty feet of the principal carriage drive. There has never been the slightest excremental odor from either the tank, which is in open view and freely exposed to the air, or from the disposal field itself.

The most difficult problem in connection with the management of an insane hospital is the regulation of the food supply. In no single department is there a greater tendency to fall into routine. Want of variety in the articles of food furnished, and monotony in methods of cooking and serving, lead to loss of appetite and consequent innutrition and lessened resistance to the inroads of disease. Not only should the quantity of the food be sufficient, but its quality should be good, its articles varied, and it should be well cooked, and served with due regard to cleanliness and propriety. I have myself derived much assistance from the diet table prepared by Professor Flint for the New York Commission of Lunacy. It should be the guide to all medical officers in charge of insane hospitals.

I am convinced by observation and experience that the general, or so-called "congregate" dining-room is a great advance over the old system of ward dining-rooms. The supervision and control of the food supply is much more thorough, and the odor of stale food does not pervade the wards. During the absence of the patients in the dining-room, the windows of the wards can be opened and the wards thoroughly flushed with fresh air. The necessary exposure of the patients in passing from the wards to the dining-room and back again is also a sanitary feature not to be undervalued. In my opinion, connecting corridors can be dispensed with ; they are no more necessary than are airing courts, barred windows, and camisoles.

The difficulties of restricting infectious diseases are greater in insane hospitals than in other institutions, but with care and intelligent direction they can be overcome. Outbreaks of acute infectious diseases, such as diphtheria, typhoid fever, etc., would, of course, be energetically combated by all medical officers, but these diseases are infrequent in insane hospitals. The great scourge of these institutions is tuberculosis, and, I fear, the apathy with which this disease is regarded by physicians in charge of the insane is largely due to the prevalent belief that there is an etiological relation between phthisis and insanity. Clouston, one of the recognized authorities upon insanity, considers phthisis one of the causes of mental derangement, and has written extensively upon the subject. I am convinced, however, that unprejudiced observation will show that the prevalence of tuberculosis in hospitals for the insane is due to the great facilities for infection and the lack of attention to means of restricting the same. This association has, by the report of its Committee on Restriction of Tuberculosis, pointed out the means of limiting the spread of this disease. By the adoption of these means, the percentage of tuberculous deaths to the general death-rate in one hospital has been reduced, in the course of three years, from an average of 25 per cent. to a fraction under 9 per cent. In the same hospital[1] there is now but a single case of tuberculosis in a total of 475 patients. The results obtained in this institution are attainable elsewhere by the use of the same painstaking care.

This paper could be extended by giving detailed instructions upon the various points mentioned ; but such is not its purpose. I have merely desired to direct attention to the essential fact, that insane hospitals should be regarded as part of the general system of medical and sanitary administration of the state, and that insane people are sick people, neither criminal nor unmanageable, who require medical care and treatment rather than correctional management or restraint.

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[1] The Maryland Hospital for the Insane at Catonsville, under the charge of Dr. J. Percy Wade, Superintendent.

THE PROTECTION OF THE INNOCENT FROM GONORRHOEA.[1]

By FERD. C. VALENTINE, M. D.,

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In a paper entitled "When May Gonorrhœal Patients Marry?" read before the Medico-Legal Congress in New York, in 1895, an endeavor was made to show the newest views of the disease, and its far-reaching effects.

After publication of this paper in the *American Medico-Surgical Bulletin*, for October 1, 1895, I was favored with an extraordinarily large number of letters on the subject, which gave incentive for the present effort.

If justification were needed for the discussion of this matter, it would be found in the statistics of the German Empire for 1894. These show that of the women who died of uterine or ovarian diseases, eighty per cent. were killed by gonorrhœa. They further show that of children who became hopelessly blind, after having been born with healthy eyes, eighty per cent. went into a life of darkness from gonorrhœa.

In Berlin, which perhaps has the best facilities for collecting statistics, there are 20,000 registered prostitutes, and 25,000 unregistered ones. The registered unfortunates are regularly examined, and thus, in great measure, prevented from disseminating disease. The death-dealing done by the 25,000 others is beyond computation.

Is there any reason to believe that a different condition prevails in our own country? American statistics are not available on the subject; if they were, I have no doubt that the figures would be appalling.

In view of these facts, the mind readily reverts to the propriety of registration of *filles publiques*. But this would prove a mitigation only, of the evil, by no means its obliteration. Inquiries made of men with gonorrhœa show that the smallest number thereof contracted the disease from prostitutes. Manifestly, then, their registration would offer but little protection.

Where, then, lies the hope of exercising the physician's noblest duty—the prevention of disease? Simply and purely in education. We should educate our gonorrhœal patients, in certain uncontrovertible facts, ever choosing terms within the grasp of their intelligence and education.

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[1] Read before the twenty-fourth annual meeting of the American Public Health Association, at Buffalo, September 15-18, 1896.

Far be it from me to attempt to instruct this learned body in the details of this disease; my hope is only to so systematize the results of practice and special study, as to facilitate for my hearers the method I employ.

The first and fundamental idea we should strive to inculcate is that *gonorrhœa is never a trifling ailment.*

This of itself is a startling statement to many. They have heard Tom Jones, let us say, boast of having had ever so many claps, which he heeded as little as he would "a slight cold." But Thomas never made that remark while he had gonorrhœa. Moreover, the likelihood is that his numerous claps were recurrences of the first, which had never been cured. "Not cured!" say you? Why, he had no evidence of disease, save a slight excess of moisture at the meatus occasionally in the mornings, and sometimes slight pain when he urinated. These symptoms, too, disappeared when he used one or another of the much-advertised drugs, which "abate all kinds of mucous discharges in three or four days." A careful, proper examination by the urethroscope would have shown either that the patient was in the condition mentioned above (chronic gonorrhœa) or that he had never had gonorrhœa at all. In the latter event, his condition would be one of catarrh of the urethra, which would have recovered more rapidly from milder treatment, or none at all.

Although now we are not discussing the possible results of gonorrhœa to the person who acquired it from unclean sexual relations, it may be well to tell him how readily he can become impotent through invasion of the epididymes; how the disease-producers can invade the joints, the heart, the brain itself.

The simplicity of all this is doubtless pathetic to my hearers. More pathetic still will the statement appear to them that a rather copious writer on sociological subjects confessed to me his ignorance of gonorrhœa as a death-dealing factor. Another brilliant writer, who associates much with physicians, asked me but yester-week where "the boil that produced his discharge" was located. On learning that he had no "boil" within the urethra, he wondered "where the pus and pain had come from." These gentlemen were types of cultured, highly-educated people. Such as they can easily be taught that gonorrhœa is dependent upon the transmission of a microbe, called the gonococcus by Neisser, who discovered it in 1872.

This microbe multiplies with prodigious rapidity. It often ascends the whole nine inches of urethra to, or into, the bladder; it penetrates the crypts, glands, and follicles; it permeates even the tissues of the urethra.

Drugs taken by the mouth, hand-injections, as almost everywhere prescribed, can have no effect on gonococci. Many cases apparently recover from their use; at least the discharge stops, perhaps for years. The truth is, that the urethra has become inured to the irritation.

Then this man, whom all, himself included, consider the soul of honor, moral and physical cleanliness, commits murder—or what is worse than murder—he marries.

His wife grows inexplicably ill. The physician, suspecting from the symptoms which have not yet developed enough physical changes to be manifest by an examination, asks the husband whether he ever had gonorrhœa. Possibly he remembers it, but deems it so long in the past as to have not even a remote bearing on his wife's illness. Indeed, it is difficult for many to believe that a gonorrhœa contracted ten, fifteen, or twenty years before could again become communicable. That it can and does, in the marital relation, is more than proved. Miles of gravestones over young wives' bodies, throughout the land, mark the progress of the gonococcus.

But if the deeper female organs are not invaded, and the child in utero grows to full term, and its eyes, passing through the infected region, become contaminated? There are eighty chances in one hundred that it will lose "the windows of the soul," and ever be a helpless burthen upon those who love it, or upon the public, which at best pities it.

These few instances suffice to convince the average intelligent man that gonorrhœa is a terribly dangerous disease. Should, then, the man once infected never marry?

The light of modern science, the electric light directly illuminating the urethra, and other tests and means of examination, will reveal whether it harbors infection. If it does, the disease must be removed, before marriage may be considered. And, no matter how old the disease, it can be recognized and cured.

The mode of treating new cases has been discussed in other papers. In two of these[1], [2] it is shown that drugs given by the mouth, and hand-injections, are of no avail. It is also there proved that, by the methods advocated, over 95 per cent. of the fresh cases recover. The average time required to thus cure a clap is ten days. And the term "cured" is used advisedly, for not only do the manifestations of the disease stop, but the patient cannot communicate it to others.

These facts alone, communicated to patients, and by them to others, will serve, when they become public property, to protect the innocent from the effects of gonorrhœa. And, through the dissemination of such knowledge, the noblest, highest purposes of associations like this are accomplished.

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[1] "The Technique of Urethral and Intravesical Irrigations," *Clinical Recorder*, February, 1896.

[2] "The Abortion of Gonorrhœa," *Journal of the American Medical Association*, June 13, 1896.

DRUNKENNESS A VICE—IT SHOULD BE SO TREATED.

By A. N. BELL, A. M., M. D.

My earliest impression of the result of the dangerous public sentiment with regard to drunkenness (which still obtains) that it is the privilege of the individual who indulges in it, was when I was a lad less than ten years of age. The incident began at a farmer's still, where a half dozen boys had assembled for play. Most of the farmers of consequence in that section of the country (Eastern shore of Va.) in those days had small stills and usually made a little brandy every year for domestic use. The stills were frequently run during the early hours of the evening. The light of the fire rendered the place round about an attractive playground for boys, both white and black. One of the latter, about sixteen years old, watching his opportunity when the attendant's back was turned, caught a cup of low wines. He soon became exhilarated by sipping it, and then it occurred to him to have some fun by dosing the little fellows, and he proceeded accordingly. One "little fellow" of my own age and an intimate playmate, was made insensibly drunk, as was also the perpetrator of the "fun." Both were taken to their beds. The little boy was seized with convulsions early the following morning, before having regained consciousness. He was for several days under the care of a physician. The fun maker had sobered up sufficiently by the second day thereafter to be taken to account by his master, a kindly man who but rarely found occasion to punish his servants, but this one had committed an inexcusable offense. He was made to take off his shirt and to receive a lashing with a cowhide. He was known to have been drunk two or three times before, but never afterwards. The "little fellow" temporarily recovered, but epilepsy supervened and continued to the end of his life, at twenty-two years of age, meanwhile becoming an idiot. I have no reason to think that drunkenness is any less common in that section of the country now than it was then, though the stills have long since passed away. They, at least, have not proved to be hereditary, though unquestionably drunkenness has, if there be truth in the faith of some modern hereditists, who believe that drunkenness is a disease transmitted by heredity even to the third and fourth generations; a faith which, if true, would make it difficult to find one among us who is not, in one line or another, at least predisposed to drunkenness. To combat the propagation of this mischievous belief in hereditary drunkenness, a faith which in its practical application rivals the liquor saloon in the encouragement of drunkenness, is the purpose of this paper.

Two other boyhood companions of about my own age are illustrative examples. They were cousins. One was the son of a notorious sot who died soon after the birth of this, his only child. He had a good mother and grew up to be an exemplary man.

The other one was the youngest of five brothers, sons of well-to-do and temperate parents. His four brothers exemplified the excellence of their environment, but not so this one. He soon took to drink and became a drunkard at the age of eighteen years.

After four years' absence and soon after receiving my medical degree, I renewed my acquaintance with those early companions, in the village where I first began to practice. I had learned nothing to increase my respect for drunkenness. And I regarded its tolerance by pity and excuse as being promotive of it. I found my old playmate, the son of a sot who, for short, was called "Kit" by his intimates, to be one of the most charming young men I ever knew, the support of his widowed mother, trusted and loved by all who knew him. The other one was called "Pret." He had well-nigh become a scapegrace. He had intervals of soberness, however, and at such times maintained agreeable traits, insomuch that some of his friends were inclined to pity and excuse him, disposed to believe that he could not resist drink. But when drunk he was repulsively disagreeable, even to his kindest friends; he seemed to delight in showing what a hog he could make of himself.

It was not many months after this renewal of our friendship before he gave me such an example of his hoggishness that I repelled it with considerable force. And like a sensible hog, on being kicked off he kept at a distance and did not forget it on getting sober. I soon after conferred with our mutual friend "Kit."

I learned from him that it was "Pret's" habit. That he had on one occasion repelled him in the same manner that I had done, and that he had been so blamed for it that he had since simply tried to avoid him, but was not always able to do so. However, we came to an understanding. And taking advantage of the sober interval, we invited "Pret" to a conference. We recognized no need of rehearsing his baseness, but told him what we had determined, jointly or severally, to give him a thrashing if he ever again approached us as he had done heretofore. "If you choose to make a beast of yourself," we said to him, "we give you warning, you must keep away from us."

It soon came to my ears that the "young doctor had shown himself to be a brute in his treatment of poor Pret." But we were not deterred, and we, or rather "Kit," had not long to wait. "Pret" had evidently determined to make an opportunity. It was on a Sunday evening when "Kit" was with his mother, on his way home from church and near his home. "Pret," so staggering as to occupy the whole sidewalk, fell up against "Kit's" mother with such force as to push her down, using foul language to her for getting in his way! This was more than "Kit" could stand. Hurriedly getting his mother through the gate, he turned upon "Pret" with great vigor. He downed him and stamped upon him. He then with the help of some friends who had witnessed the offense and the beating, took him to his home. His plight was explained to his father and the cause of it.

The next morning I was summoned. Boot heels had left their impression, and both eyes were closed. But there appeared to be no reason to fear any bad results from the beating. For the rest, however, I quickly made up my mind to make the most of my first case of drunkenness—to cure it if I could. I had at the time a case of pneumonia. The lancet was then—fifty-four years ago—about being displaced, in the treatment of that disease, by tartar emetic. The circumstance suggested to me the use of the same remedy in this case of drunkenness. "Pret" soon became a very sick man, and his appearance several times so death-like as to alarm his parents. I managed to keep their confidence, however, and encouraged them to hope for recovery. His mother suggested that he was so weak that she thought he might have a little wine. I assented, but took care to add antimonial wine to it, and he couldn't keep it on his stomach. I was more afraid of letting him get well too soon than keeping him sick too long. I finally let up on him, and by the end of the third month he was able to be about. A month later he was well and sober. "Couldn't even bear the smell of liquor." He so continued to the termination of my residence there, a year longer. And I was gratified to learn upon inquiry, long after, that he never again took to drink.

A little later I became an assistant surgeon in the navy, at a time when grog was regularly served to seamen twice daily as part of the ration, and the "cat" was used as a means of discipline; when drunkenness off duty, if not coupled with bad behavior, was excusable. But who, pray, among drunkards themselves, or other observers can vouch for the good behaviour of one who is drunk? Who that does not know that to be drunk is to be beyond self-control; that to get drunk is to place one's self in the condition to debase his race, to commit arson or murder, even when off duty; or, when on, to wreck a train of cars or sink a ship? *The* crime is, primarily, to get drunk. The crimes in consequence of being drunk may be more appalling, but they are less heinous. But I would not get ahead of practical examples.

Among my earliest experiences in witnessing punishment in the naval service was one of a sensitive young man of twenty-two years of age, whose history I had learned through his having been seriously ill sometime before. He was the son of a drunken father, whose bad treatment had driven him to enlist. He confessed to having been on several "larks" before entering the navy, but did n't think that he had ever been "what you might call drunk." However, from the outset of his service he had never omitted taking his "grog," except when he was on the sick list. On his first day's liberty ashore, after many months' confinement to the ship, he quickly became the ringleader of his gang in a mischievous carousal. He was brought aboard "dead" drunk. He required no medical treatment, and was placed in confinement. A week subsequently all hands were called to witness punishment. He then asked to see the surgeon. I think I have never witnessed such an expression of unutterable distress in any countenance as I witnessed in his case. There was no evidence of any sickness that he complained of to justify the omission of punishment. Yet he tried to make me believe that he should surely fall dead at my feet if he was not excused ; he could not stand it, and he knew it would kill him. He was taken from the "brig," stripped and "triced up." The agony of his expression appealed to every one present, but to no one more forcibly than to him who wielded the "cat." He was punished, but not severely, and ordered to duty. But the shock was too great for him. An hour afterwards I was called to him, and found him to be in a state of semi-collapse, the pulse weak, but regular, and the respiration interrupted by frequent sighing. It was relieved by a few doses of aromatic spirit of ammonia and tincture of ginger. But I kept him on the sick list for a few days, and made use of the opportunity to remind him that he was not degraded by the punishment that he had received, but by the drunkenness which had brought it about. He vowed never to drink liquor again. He was ever after a restraining force on the behaviour of those with whom he was subsequently granted liberty, and thoroughly trustworthy. He kept his vow.

A few years later, I found myself the messmate of two officers, habitually subject to drunkenness when off duty, and liable to it when on. It was not long ere one of them, on returning from an afternoon on shore, in a foreign port, had to be assisted on board in sight of the commander of the ship, and his was the mid-watch of that night. Plainly he would not be able to keep it, and, though drunk, he knew it. He had been drunk many times before. He sent for me, to know if I would put him on the sick list. To this I readily assented. This, of course, excused him from watch. I handed my list to the commander, as usual, the next morning. He looked at it in my presence, and found opposite Lieutenant Q.'s name —"Gastric derangement." He asked me if Mr. Q. was much sick, but with a quizzical expression, which seemed to question my reliability. I replied that he was indeed *very* sick, and likely to be on the list for several days, and perhaps for weeks. Yet he looked incredulous ; he had known Mr. Q. for several years, as he had also known others addicted to the same kind of illness, generally of only a few days' duration at most. I explained to him that I had been up most of the night with Mr. Q., that his stomach was terribly upset, vomiting and retching most of the time, despite mustard and other external appliances. And such was really the case. I had begun treatment similar to that already described in "Pret's" case. I pursued it for three weeks, by the end of which time Mr. Q. was quite weak and a good deal emaciated. He slowly but steadily convalesced. He persuaded himself that the climate was bad for him—it was on the coast of Africa—and tried to persuade me to second him in making application to go home. On this, however, I took decided issue with him, reminded him that the cause of his illness would be no less dangerous to him in any other climate than was that of the African coast; that, in short, a few more drunks such as that through which he had but just passed, would be fatal to him in any climate. He was restored to duty, and abstained from liquor for about six months, when he suffered a dinner party to initiate another spree. He was again incapacitated for duty, and subjected to a similar course of treatment. He recovered, as before, but with the determination never to drink any more intoxicating liquor. I suggested to him that it would be well for him to strengthen his promise by writing to his wife his renewed determination. (He had been intemperate before marriage, and married under the promise that he would quit drink, but soon after broke his promise, and rendered his wife miserable.) He did so, and in verification of his earnestness he showed me the paragraph of his letter. He was ever after a changed man. He was effectually cured. We terminated the cruise together. I saw him frequently during subsequent years, until within a year of the time of his death, in action in the second year of the war. The other messmate afforded me a like opportunity for treatment, but with a fondness for liquor, and a wilful determination to drink it at all hazards, that was shocking. I cite his case only to show the subordination of his will to his passion for drink. He was a young man of unusual brilliancy; possessed the most remarkable memory of any one I ever knew; could literally rehearse matter on many subjects that he had read but once years before. But he was a wicked man, with no religious instincts, and eschewed moral restraint. My last appeal to him was made while he sat up in bed, recovering from a recent debauch. I said to him, "S——, you remind me of an incident of which I have read, that is said to have occurred in the life of the famous Archdeacon Paley," which I related. He entered Christ's College, Cambridge, when he was but sixteen years old, and at once took rank as a brilliant student, while during the first two years of his course he led a most dissolute and dissipated life. He would spend half the night in carousal, frequently rendering himself subject to punishment and threatened expulsion, and yet he was found at the head of all his classes at recitation. It was at the height of his excellence in dissipated habits that one morning a fellow-student sought his assistance for the solution of some difficult problem, and knocked at his door. "Come in!" he responded. He was sitting up in bed, with a pipe in his mouth, a glass of liquor in one hand, and a bawdy book in the other. His visitor looked on for a moment in amazement until Paley said: "Well, what are you staring at; what do you want?" "I am staring in amazement at you. I have called to ask your assistance, and I am shocked at your appearance—dissipating capabilities, which if conserved and utilized as they should be, would ere long make you one of the first men in the kingdom."

"You think so, do you?" replied Paley, and he let fly the book at his caller; then the glass with its contents, and next the pipe. "Now," said he, "let's see what you want." He rendered the needful assistance. Paley was ever afterwards a diligent student, and became a philosopher of continued fame. S—— heard me patiently, and said: "Well, suppose I were to stop drinking now, which I could do if I were of mind to, how long do you suppose I would live?" (He already had hypertrophy of the heart, and was short winded.) I replied: "You well know that you are already a good deal damaged, but by such care of yourself as you ought to take, you would probably live ten years and maybe more." "And how long if I do n't stop, and go on drinking just as you have seen me, and as I have been doing for the last five years?" "Not two years, and perhaps not one fourth of that time." With a shocking oath he replied: "I 'll drink and take my chances." He died in less than two years.

Passing an interval of twelve years, now settled in Brooklyn, I was hurriedly sent for one morning to visit a gentleman whose family I had occasionally attended at one of our most fashionable hotels. I found him in a wild state of delirium tremens, and his wife and three daughters terribly frightened by several attempts he had made to get out at the window. With the assistance of a servant, he was at once induced to get into my carriage, and I took him to the Brooklyn hospital, of which I was one of the staff, and at the time on duty. After a week's treatment in the delirium ward, he recovered his reason, and became sensible of his surroundings. He was overwhelmed with mortification and grief to find himself there, and with much difficulty consoled, after allowing him to examine the hospital register himself, in verification of my assurance that his name was not recorded or known to any one connected with the institution but myself—another name having been substituted for the occasion. His wife was sent for, and on my advice he was kept in the same ward, with iron-barred windows for two months, his wife being with him, and his chief nurse. He begged hard for liquor during the first two weeks after recovering from delirium, but by the end of that time he began to understand the earnestness of the assurance of his wife and myself, that it had been definitely stopped; that he was *never* to drink liquor again. He became more and more reconciled to this determination, and before the end of the second month promised us he would never drink again. He was a man of forty-four years, a tea merchant by occupation, one of four sons and two daughters of temperate but not abstemious parents. He had been a free liver, and subject to occasional sprees for a dozen years, but this was his first attack of delirium tremens. All the other members of the family were temperate. About four months subsequent to his discharge from the hospital, on New Year's day, he called at my house and left his card. On the reverse of the card was the picture of a hat with a brick in it holding it down. He died a few years ago, at nearly seventy years of age, twenty years subsequent to his having been thoroughly cured by two months' confinement and appropriate treatment in the delirium ward of a hospital.

It would be easy for me to multiply examples from my memory of a multitude of cases, but my purpose has been to cite only such and so many, as serve to show the common aspects and dangers of drunkenness, and its curability by timely and appropriate treatment.

But I am not unmindful of its liability to become incurable by wilful persistence until the will is overcome, and the individual loses his power of restraint, becomes an imbecile, epileptic, idiot, or insane. These are consequences with which all observers are familiar. Moreover, that the descendants of drunkards are commonly defective, in one way or another, but no oftener drunkards than defective in other respects—weak-minded, imbecile, idiotic, insane, paupers, tramps, thieves, house burners, and murderers; that they are, in short, the recruiting host of almshouses, asylums, jails, and penitentiaries all over the world, is common knowledge. These conditions immensely add to the force of my argument.

But I would not have it supposed for a moment that I am ignorant of the special pleading of the advocates of hereditary drunkenness, or that drunkenness—called by another name or otherwise—is a disease. The periodical literature of the day, reflecting the treatises of inebriate asylum keepers, is so overloaded with such pleading and wasted sympathy that he who runs may read. And as little do I intend to submit my observations, unsupported, in rebuttal of such fallacies.

In the report of the surgeon-general of the U. S. Army, for the year ending June 30, 1895, Captain and Surgeon W. H. Arthur reports having reduced the statistics of alcoholism at Vancouver Barracks by dealing with drunkenness as with acute poisoning, as follows:

"The report of the surgeon-general for the year ended June 30, 1892, mentions this post as having out of all the army the highest rate of admission to sick report for alcoholism. The number of cases of simple acute alcoholism that appeared at sick call, and during the day, when I first assumed charge of this hospital, was unusually large, and resulted in the laying down of certain rules in an effort to discourage drunkenness as far as it was in my power. No man is taken on the sick report or excused from any duty, unless, in my opinion, his condition would make it actually dangerous for him to keep at work. I may say here that such cases are in my experience very rare, and that a mistaken pity for a man suffering from the effects of a debauch is liable very often to lead a too indulgent post surgeon to excuse him from duty when the guard-house, and not the hospital, is the proper place for him. I am confident that this mistaken kindness has done a great deal in the past to encourage drunkenness. Each man who has reported at the hospital in any stage of simple alcoholism is treated as a case of alcoholic poisoning, taken immediately to the operating room, his stomach emptied by the use of the stomach-pump, and thoroughly washed out with warm two per cent. soda solution. After this he is given a bowl of hot beef extract, with cayenne pepper, allowed an hour's rest, after which he is generally perfectly able, however unwilling, to do his duty. If the weather is severe, either very hot or very cold, it might not be safe in his depressed condition to force a man to work out-of-doors immediately after this procedure, but at this post the extremes are not great, and it has in no case resulted prejudicially to the patient. Occasionally some resistance is met with, but two, or at most three, able-bodied hospital corps men, and a perforated wooden gag, such as comes with the stomach pump, will, with patience and determination, overcome almost any ordinary opposition. I have found for this purpose, the gum elastic stomach-tube in the old-fashioned stomach-pump case, connected with Allen's surgical pump, work very satisfactorily. The ordinary soft rubber lavage tube is too easily collapsed, and is more difficult to introduce when there is resistance.

"The effect of this treatment has been uniformly excellent. The stomach, emptied of its irritating contents, and cleansed of the thick, tenacious mucus that is always present in such cases, is much less irritable, and rarely rejects the beef extract which is given immediately; the nervous symptoms improve at once, and sedatives administered by the mouth have a far more prompt and lasting effect, and in almost all cases the craving for liquor is very much diminished. Of course, cases may occur which are too serious for such summary treatment. I have not met with any myself, and have used the stomach-pump with good effect in cases even of delirium tremens and alcoholic coma. These cases, of course, are promptly taken into the hospital, and treated as dangerously sick men. The deterrent effect of this treatment is excellent. It is, of course, not agreeable, though no one can deny that it is perfectly rational and merciful. In the past ten months but one man has been admitted to hospital for alcoholism. There are, no doubt, other factors that enter into the production of this marked change in the post in two years, but I am confident that this method of treating alcoholism as poisoning has been a very important, if not the principal, one. I may add that in but one case has it been necessary to use this treatment on the same man more than once."

Dr. A. Motet, medical expert of the tribunal and the court of Paris, in a paper on Intoxication and Crime, read at the Fourth International Prison congress, St. Petersburg, in 1890,[1] says:

> Simple intoxication is that which prostrates a man, otherwise healthy, after excess. We do not wish to enlarge on the varieties of simple drunkenness, although the nature of this poisonous agent plays a great rôle in the evolution of possible accidents. We hold to this precise determination that temporary drunkenness may be avoided by individuals. Hence, the act is voluntary, and the consequences are chargeable to intoxication whether or not the drunkenness is habitual. * * * "Drunkenness is a voluntary and reprehensible fact, and it can never constitute an excuse which morality or law will

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[1] C. D. Randall's Report, Circular of Bureau of Education, No. 2, 1891.

accept." Mark and Tardieu are of this opinion. It is also ours. Simple intoxication is punishable because it can, if unpunished, begin to-morrow the same excesses of which the consequences will be to compromise again the interests of society and individuals.

Pathological intoxication differs from the preceding, in that the pre-existing morbid condition added to the usual symptoms, acutely aggravated by alcohol, assumes a character immediately dangerous. According to the expression of Lentz, "alcohol lights the fire whose ravages will be more extended in proportion as the materials upon which it feeds are more combustible."

And there exists besides insane, properly called, imbeciles and epileptics with whom drunkenness is especially deplorable, a numerous class of degenerate persons, bearing heavily the burden of pathological heredity, capricious in their ideas and in their acts. These are the true maladies in which the intoxicating action of alcohol manifests itself more frequently by dangerous impulses. These are the unbalanced, the hereditary drunkards who cause the most serious embarrassment. * * *

The considerations which we submit to the congress have aimed, above all, to separate simple from pathological intoxication. However, we believe we are authorized to present the following conclusions:

1. In the interest of social order, of family protection, of individual preservation, voluntary intoxication should be considered as a misdemeanor, and severely repressed, with increase of punishment in the case of relapse.

2. The habitual drunkard should be deprived of his civil rights, and his removal from office should be secured by the public minister. And as a corollary, we add that persons affected with delirious attacks, active or subactive, from alcoholic intoxication, should be maintained in a special establishment during a long time. Their discharge should be postponed until every trace of intoxication has disappeared, and an early relapse will not be feared.

To give our thought a more definite form, we will say:

Drunkenness is punishable, as well as misdemeanors or crimes committed under its influence, when it is classed as simple, and when it is manifestly in the power of the delinquent to avoid it.

It is punishable with increase of punishment when the intoxication has been sought to incite the commission of a crime or misdemeanor.

Drunkenness is punishable, but with a degree of mitigation which belongs to the magistrate to determine, in the case of persons with feeble intelligence, whose ability to resist alcoholic desires is diminished by the inferior condition of their mental organization. They should not be exculpated when they know that they cannot drink without danger, and this is the case more frequently than is supposed.

Crimes or misdemeanors cannot be so regarded when they are committed during delirium, acute or subacute, from a paroxysm of alcoholism. It is the same in a case of chronic alcoholism, when the definite cerebral injuries have compromised the integrity of the organ, and determined the durable disorder of its functions.

Opposed to such observations and practical results in the rational treatment of alcoholism, and to the application of such practical measures as have been evinced by independent scientific investigators with special reference to human welfare and the well-being of society, are the inebriate specialists and their puerile satellites, the "scientific temperance" bookmakers, who are bent on holding up the present generation of drunkards as pitiful objects of a hereditary "disease" for which they are not responsible—a "disease" bred in the appetites, livers, and bones of their *male* ancestors; for, be it remembered, the statistics which such "authorities" adduce are almost wholly confined to the male ancestry; by which it appears that daughters are not subject to hereditary drunkenness, as they are not to the saloons and other environments where drunkards are commonly made. But I do not mention saloons even as an excuse for drunkards. Saloons would not exist but for the patronage of wilful tipplers and drunkards who support them. I would not put the boot on the wrong leg.

As illustrating the relation of saloons to drunkenness, it appears that since the famous Raines Liquor law went into effect in the city of New York, considerably reducing the number of saloons, and prohibiting those which remain from opening on Sunday, drunkenness has greatly increased. The statistics of Bellevue hospital, which is the only institution in the city where drunken persons are received as patients, show that from July 1—when the law went into effect—to August 20, 649 cases of alcoholism were treated, in the men's division alone, against 400 cases for the corresponding period of the year 1895—a gross increase of 249 cases for the fifty-one days, and an average increase of five cases daily;—plainly showing that drunkards do not depend upon the saloons, though they are ever ready to resort to them.

Nevertheless, the apologists for drunkards are ever ready with excuses, and expressions of profound sympathy for them. "Poor fellows, they cannot help it"—cannot even help going into a saloon—they say. And they discourse learnedly on inebriety as a disease, but always require their own skilful treatment in a "home" equipped for profit.

Surely nothing can be more pleasing or encouraging to drunkards than to have the public mind thus abused, and their relatives imposed upon for means to support them in idleness and luxury during a period of remorse. The "cures" in such institutions, like the Keeley "cures," are frequent in the same individual. But at the last it commonly happens that the "disease" has become so deeply seated that the individual, if his relatives can afford it, has to be provided with permanent quarters in the "home," to be kept out of sight of his relatives as much as possible, but still pitied and petted as an unfortunate "invalid."

It would be easy to draw the parallel of a drunkard with the thief in their respective tipplings, deeper crimes and final "homes," the one in the inebriate asylum, and the other—where both ought to be—in the penitentiary. These may be harsh words to some persons—persons whose affections have been torn by drunken relatives. But they are the expression of a conviction founded upon extensive observation and deep study.

But I would not be understood as wholly denying that drunkenness may be hereditary. The physical structure of the human body under the persistent use of alcohol is indeed liable to become diseased in a variety of ways. The progeny of such diseased persons, as already shown, are more likely to become intemperate, as they are more likely to become epileptics or insane, than the children of healthy parents. But to reason from such premises that intemperance, from the beginning, is a disease and not a vice, is to accept the weak-minded progeny of drunkards as the type of manhood, and to assume an incapacity for conscious purpose as the measure of the human will. Such, indeed, appears to be the standard by which the inebriate specialists measure man's capacity for self-control.

But, measured by common observation, extensive study, and the records of institutions for the care of defectives and criminals everywhere, clearly of all vices which afflict human society by both tolerance and perpetration, drunkenness is the most common and the most debasing. To arrest it, it should be made proportionately odious and punishable.

ON THE APPLICATION OF THE SERUM DIAGNOSIS OF TYPHOID FEVER TO THE REQUIREMENTS OF PUBLIC HEALTH LABORATORIES.[1]

By WYATT JOHNSTON, M. D., Montreal,

Bacteriologist to the Board of Health for the Province of Quebec; Assistant Professor of Hygiene, McGill University; Pathologist to the Montreal General Hospital.

Great interest attaches to Widal's important communication to the effect that the serum of persons suffering from typhoid fever, even in the early stages, is capable, when mixed with a pure culture of the typhoid bacillus in bouillon, of arresting the active movement so characteristic of this organism and causing the bacilli to agglutinate into clumps resembling zooglœa. The serum of typhoid convalescents and immunized animals had been shown by Pfeiffer, Durham, and Gruber to possess this property. But Widal has certainly been the one to demonstrate its great clinical value. With the serum of an undoubted case of typhoid fever we are able to apply what appears to be the most conclusive of the tests at our disposal in deciding whether a given organism is really the typhoid bacillus or not. On the other hand, with a culture of the genuine typhoid bacillus, we are able to decide whether a doubtful case is or is not typhoid fever.

Although the test is so recent in origin, those who have tried it appear practically unanimous as to its being of great delicacy, and, in particular, the negative results which it furnishes are of nearly as much practical value, something which can scarcely be said of the routine bacterial tests for tuberculosis.

Widal's original method was to obtain the serum from the vein of a patient's arm by means of a sterilized syringe, descanting the serum after it had separated and adding it to bouillon culture of typhoid bacilli. This was then placed in the incubator, and showed, after several hours, a flocculent precipitate composed of the immobilized and agglutinated bacilli and a clearing of the upper part of the fluid. This was found by Widal to be characteristic of typhoid blood. The blood in other febrile disorders, such as malaria, typhus, tuberculosis, pyæmia, etc., as well as the serum of healthy persons, was found to have no power of producing this phenomena when mixed with typhoid cultures. Those who have repeated Widal's experiments have also been able to confirm his statements that the colon bacillus does not give this reaction with typhoid blood.

Widal was fortunately led to simplify the method materially by taking a few drops of blood from the finger tip, and as soon as the serum was separated from the edge of this, mixing it with a drop of actively mobile typhoid culture, whereupon the reaction could be satisfactorily observed under the microscope and was usually complete in a few minutes.[1] Dieulafoy testifies to the remarkable accuracy of the test and its value in diagnosticating obscure cases.

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[1] Read before the American Public Health Association, at Buffalo, N. Y., September 17, 1896.

My attention was first directed to the test through having been consulted by physicians as to the nature of suspected cases of typhoid, and my experience has been thoroughly in accord with that of Widal and others as to its great value as an aid to clinical diagnosis.

As the reaction appeared to depend probably upon the presence of some substance analogous to the ordinary toxines, and as many of these preserve their characteristics in a dry state, it naturally occurred to me that this might be true of the substance producing the serum reaction. The advantage of being able to operate with a dried substance was obvious, especially with reference to the possible application of the method to the rapid bacteriological diagnosis of typhoid fever in municipal laboratories, just as is now done in the case of diphtheria, and my observations have been made with this end in view.

Instead of taking the serum as soon as it exuded, I allowed the drop to dry, and found that upon moistening it subsequently the solution obtained was just as efficacious as the pure serum for the diagnostic purposes of the test.[2]

This power appears to remain practically unimpaired even after the blood has been allowed to dry for many days. My experiments upon how long the blood will continue to react when in this dry state are not yet finished, but blood drops dried for from two to four weeks still give the reaction.

In this manner I have tested the blood of ten patients suffering from undoubted and typical attacks of typhoid. The reaction was obtained conclusively in every instance. In eight cases the loss of mobility and the agglutination was complete in from two to fifteen minutes. Of the two others, one, in a very early stage of the disease, required thirty minutes for the completion of the reaction, while the other in a very late stage, following a relapse, required one hour.

The blood of ten other hospital patients, as well as a number of healthy individuals, was next tested, and in no single instance was the reaction obtained. Occasionally a pseudo-reaction with some agglutination was observed within a few minutes of the mixture of blood solution and culture, but some movements of translation (wandering through the field) always persisted on the part of isolated bacilli, and these gradually increased in number and activity till, in an hour or two, lively motion was resumed, and was found to be still present on the following day and, in some instances, where it was followed up, at the end of a week. With the typhoid bloods nothing but the oscillating or "Brownian" movements were seen, as a rule, though where the proportion of serum added was very small peculiar revolving and tugging movements, apparently due to the action of the flagella, could be made out, movements from one part to another of the microscopic field being, however, completely abolished.

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[1] This plan of observing the reaction directly under the microscope had been published by Gruber and Durham some months previously.

[2] Since writing the foregoing, I have been able to obtain fuller accounts of Widal's work than were at first available, and find it stated by him that dried serum, and to a lesser extent dried blood, are capable of furnishing the reaction. This circumstance does not appear to have been hitherto utilized practically.

In two doubtful cases examined for diagnosis the results were negative. In one of these the malaria plasmodium was subsequently detected. The other left the hospital before the diagnosis was cleared up, but her temperature had remained normal for two weeks, and her only symptoms were persistent headache and giddiness. One of the control cases, examined with negative results, had a history of typhoid two years previously.

In making a communication upon this subject before the American Public Health Association, at Buffalo, N. Y., on September 17, 1896, I subjected the method to what I considered to be a fair practical test as to its applicability to public health purposes. I left instructions for Dr. D. D. McTaggart, resident pathologist, to forward by post to my destination, after I had left Montreal, a letter containing dried blood drops from several cases of undoubted typhoid fever and also dried blood drops for control from other hospital cases, preferably patients suffering from febrile conditions, but making sure that they had not had typhoid recently. All these blood drops were to be numbered and a key giving the clinical diagnosis in each case placed within a separate sealed envelope.

I left Montreal September 13th. Samples of blood from six patients were collected, and forwarded as directed, on September 14th. On September 16th, the letter was delivered unopened at Buffalo, N. Y., to Dr. Bissell, the city bacteriologist for Buffalo, who kindly took charge of the key. At the end of an hour spent in examining the specimens, I wrote my diagnosis upon the outside of the sealed envelope. It will be seen from the subjoined signed statement, which Dr. Bissell kindly made at my request, that the results were perfectly in accord with the clinical diagnosis in each case, while the specimens, which were then examined by a number of competent bacteriologists, showed that good objective grounds existed for arriving at the conclusions given.

STATEMENT BY DR. MCTAGGART, RESIDENT PATHOLOGIST, MONTREAL GENERAL HOSPITAL.

The samples of blood were mailed to Dr. Johnston one day after he had left Montreal. Dr. Johnston had no knowledge of the contents of the "key," and no private means of knowing which of the numbers referred to typhoid and which to non-typhoid blood.

(Signed) D. D. McTaggart.

STATEMENT BY DR. BISSELL, CITY BACTERIOLOGIST, BUFFALO, N. Y.

Buffalo, September 16, 1896.

Received to-day from Dr. Wyatt Johnston a sealed letter, mailed in Canada, with postmark, "Montreal, September 14, 1896." This was opened by me and found to contain (*a*) six glass cover slips, numbered from 1 to 6, with a drop of dried blood on each, and (*b*) also a sealed envelope marked "key." Received from Dr. Johnston, after examining the blood by the (Widal) serum diagnostic test, the following report: No. 1, typhoid; No. 2, typhoid; No. 3, typhoid; No. 4, not typhoid; No. 5, not typhoid; No. 6, doubtful, probably not typhoid. The key was then opened by me, and the clinical diagnosis from all cases found as follows: No. 1, typhoid; No. 2, typhoid; No. 3, typhoid; No. 4, malaria; No. 5, enlarged glands of neck; No. 6, heart disease.

(Signed) WILLIAM E. BISSELL.

It will be noticed that a qualified though correct opinion was given at the time of my making the report in one of the negative cases (No. 6). This doubt was owing to the fact that it was the last specimen examined, and that a partial agglutination appeared to take place at first, though motion was not abolished. Subsequent examination some hours later showed such lively motion that I should have had no hesitation in declaring it not to be typhoid, had the circumstances permitted that much delay before an opinion was given.

A ready means of diagnosis in typhoid fever is something which has long been desired by sanitary officials. The medical profession is proverbially lax with regard to the notification of typhoid cases, and we may assume that this neglect is in part due to the want of any adequate *quid pro quo* in return for such notification. Probably the assistance derived from a prompt bacteriological diagnosis, or even corroboration of diagnosis in the early stages of typhoid, will lead to the more uniform reporting of cases. Besides distinguishing typhoid from such well-characterized diseases as tuberculosis and malarial disease, this test may also be expected to clear up the mystery which surrounds those doubtful cases of so-called bilious fever, remittent fever, gastric fever, typho-malarial fever, etc., which are so common in times and places where typhoid is prevalent, and rare in the absence of typhoid, at least in temperate regions which are free from malaria.

Those who are called upon to investigate epidemics of typhoid are much perplexed by the large number of cases of ill-defined and transitory fever occurring among those personally exposed to the infection, and the impossibility of coming to anything like a definite conclusion upon the evidence hitherto obtainable as to whether these are to be regarded as cases of abortive typhoid or not. In my own experience, such cases have usually equaled or outnumbered the cases where the symptoms justified a definite diagnosis.

I may add a few words with regard to technic. I use a dry lens of about one-fourth inch focal distance. The dry blood drop is partly dissolved with germ-free water, and a drop of the solution obtained is placed upon a cover glass which has just been passed through a flame and mixed with a drop of a typhoid bouillon (a watery suspension of an agar culture also answers very well). This is placed over a hollow cell sealed by vaseline. I control the examination by comparing it with a blood drop from an undoubtedly typhoid case, and also with normal blood. It is also advantageous to place a minute drop of the blood solution upon the cover slip alongside the mixture of culture and serum, so as to satisfy one's self in negative cases that the blood contains no motile bacteria. Uniformity of temperature is the chief detail to be attended to, as the agglutination does not take place so well if the movements are sluggish.

A hot-water dish filled with warm water forms a cheap and convenient substitute for an incubator, and a simple warm stage made of a sheet of copper is also useful. In a well-warmed laboratory, however, the use of these adjuncts is unnecessary. Hollow cells are convenient, but not indispensable. For collecting the blood drop, any smooth surface suffices; cover glasses or slides have the advantage of being clean and sterile, but I have found ordinary writing paper or smooth cardboard most convenient, as it could be more easily labeled or forwarded. The swabs used for diphtheria outfits will answer, but the presence of extraneous substances, such as fibres, was found annoying. The presence of blood pigment is rather an advantage, as it enables the drop to be more easily focused. The small fibrin particles of clot sometimes bear a superficial resemblance to the islets of agglutinated typhoid bacilli, but are readily distinguished from them by the presence of leucocytes in their meshes.

One advantage of having the blood dried is that it insures it against contaminating growth occurring during shipment. In case any doubt as to the reaction exists at first, it will usually be dispelled by watching the preparations for some hours, or, if necessary, for a day or two. This permits a decided and progressive increase of motion in non-typhoid cases and allows the more perfect agglutination in the genuine ones.

The one indispensable factor is perfect purity of the culture. The one which I use was kindly forwarded me by Mr. J. J. Mackenzie, bacteriologist to the Ontario Provincial Board of Health, and was stated to have come originally from the Berlin Hygienic Institute. It grows typically on gelatin, potato, bouillon, agar, and milk; reacts typically with litmus agar, produces no indol or gas, and shows the motility and staining reactions characteristic of the Eberth bacillus.

I have made this communication because the method here suggested seems better adapted than those hitherto employed for bringing this test within the range of ordinary public-health laboratory work, and enabling it to be dealt with, if I may so express it, in a wholesale manner.[1]

This article was published in the "New York Medical Journal" of October 31, 1896. Further articles on the same subject were published by me in the "New York Medical Journal," November 28, 1896 (with Dr. D. D. McTaggart) in the "British Medical Journal," December 5, 1896; Circular of the Board of Health of the Province of Quebec, January 7, 1897 (with Dr. D. D. McTaggart) in the "Montreal Medical Journal," March, 1897; "Centralblatt für Bakteriologie," Baud XXI, 1897.

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[1] Drying the blood as a preliminary step has enabled the Board of Health of the Province of Quebec to offer to the medical profession here a free public service of typhoid diagnosis by the serum method similar to that which is followed in diphtheria. Outfits consisting of a folded and sterilized piece of paper, in which the blood drop is sent inclosed in a suitable envelope, are placed in convenient depots. In case of negative results, an additional sample, taken by collecting a few drops of blood in a small glass tube, is examined, but this extra precaution is seldom necessary. As to the degree of accuracy which this application of the test may afford, it is too early to speak positively. From my experience hitherto, I am inclined to believe that it will compare not unfavorably with those obtained in the cases of diphtheria and tuberculosis. In one case the reaction was present on the third day.

LABORATORY OF THE BOARD OF HEALTH OF THE PROVINCE OF QUEBEC.

CIRCULAR ON ATTENUATED TEST CULTURES AS A SAFEGUARD AGAINST PSEUDO-REACTIONS IN SERUM DIAGNOSIS OF TYPHOID BY THE DRIED BLOOD METHOD.

MONTREAL, 7th January, 1897.

To the President of the Board of Health of the Province of Quebec:

SIR: In my work in serum diagnosis done jointly with Dr. D. D. McTaggart, we recently met with a series of peculiar partial reactions in which the dried blood solution from many perfectly healthy persons gave a very decided agglutination. The blood serum from the same persons was found much less liable to give these pseudo-reactions. This made it less easy to exclude other febrile diseases, and as with this test accuracy in the negative diagnosis is of great practical importance, others who may meet with similar pseudo-reactions will be interested in learning how they may be avoided.

These pseudo-reactions were not encountered in our earlier cases when attenuated cultures were used. They began to appear when we employed a short time virulent cultures, and disappeared again on resuming the use of attenuated ones. Active, virulent cultures, intensified by daily transplantation and growth, at the body temperature, are therefore not suitable for the dried blood test. Where only active cultures are employed, we do not think that the dried blood method can be considered to have had a fair trial.

The explanation of this difference appears to be that the serum contains relatively less of the substances causing agglutination than solution of the entire blood. Hence solutions of the entire blood react more intensely to the test than solutions of the blood serum alone. This was the reverse of what we had anticipated.

It is found that old laboratory stock cultures kept at room temperature, and transplanted at intervals of about one month, give us the best results. Bouillon test cultures grown from this stock for twelve to twenty-four hours at body temperature are found to react decisively with solutions of typhoid blood or typhoid serum, the reaction being, as a rule, well marked within fifteen minutes. With non-typhoid blood or serum solutions, the same test cultures give no reaction even after twenty-four or forty-eight hours' contact. Intraperitoneal injection of one c. c. of such living bouillon culture produces in guinea pigs a marked blood reaction and immunity without much disturbance of health. We find that the best results in cases of dried blood are obtained with cultures where the motion, as seen under the microscope, is of a rapid, gliding character, but free from darting movements. If the movement is sluggish, owing to too great attenuation of the culture, a few daily transplantations at body temperature will make it more active. Exact estimation of the degree of dilution has not been found necessary for ordinary diagnostic work when attenuated cultures are used. A very faint tint in the drop examined usually indicated sufficient strength. The solution should not be thick and viscid.

All the results which I have reported ("N. Y. Medical Journal," Oct. 3, 1896, and "British Medical Journal," Dec. 5, 1896,) were obtained with attenuated cultures. A report, giving some additional technical details, has been prepared, and can be sent to any who desire further information.

I remain, yours respectfully,

WYATT JOHNSTON,

Bacteriologist to the Board of Health, Province of Quebec.

NOTE.—Subsequent experience has confirmed the above statements as to the best method of technique with the cultures which I have used. From the recent literature of the subject it seems, however, established that the cultures used by others give the best results under different conditions, so that it is safer not to generalize.

THE PROPHYLAXIS OF TYPHOID FEVER.

By JOHN ELIOT WOODBRIDGE, M. D.

Mr. President.—It has been stated, upon excellent authority, that typhoid fever causes fifty thousand deaths and prostrates, at least, five hundred thousand other victims annually in the United States alone. Allowing an average period of six weeks of illness for each of those cases, estimating the value of the lives at one thousand dollars each, the cost of boarding and caring for the patients, together with their loss of wages at ten dollars per week, and the cost of the funerals at twenty-five dollars each, brings the money cost of this one disease in this country to the enormous sum of eighty-three millions, one hundred and twenty-five thousand dollars ($83,125,000).

What these fifty thousand deaths and these three millions of weeks of miserable sickness cost the patients, their friends, families, and physicians, in pain, anguish, and anxiety, can neither be described in words nor portrayed in colors.

The prophylaxis of typhoid fever is therefore a subject of such vital importance to the sanitarian, to the physician, to the individual who is threatened with the disease, to the community at large, to all local and city governments, and to the general governments of the Dominion of Canada, the Republic of Mexico, and the United States of America, as to merit the earnest consideration of their representatives here assembled.

We are slowly awakening to a realization of the fact that recent scientific discoveries have imposed new responsibilities and new duties upon peoples and governments.

As long as epidemics, plagues, and pestilences were supposed to be visitations of Divine wrath, men very naturally turned to the gods they worshiped for deliverance, but since they are learning that typhoid fever, cholera, and kindred diseases are traceable directly to the pollution of drinking waters, and are consequently preventable, they will turn to their governments for relief.

Typhoid fever is a water-borne disease, and every attack is the child of a previous case, and every attack is *prima facie* evidence that the victim has eaten or drunk unsterilized human excrement, or some of the products thereof, and every attack is evidence that somebody has sinned, and somebody should be held responsible.

A distinguished British sanitarian has said that "Every death from typhoid fever should be treated as a homicide, and should be made the subject of a judicial investigation," and one, speaking more boldly than the others, said, "For every death from typhoid fever somebody should hang."

Since science has pointed the way, every government which does not, as far as its power extends, take every precaution to give its people an undefiled water-supply, is morally, and should be held legally, responsible for every death caused by its negligence, but the task of providing unpolluted water for all of the people is one of enormous magnitude.

There is no practicable means by which impure water supplied through public conduits can be made wholesome; there is no way of filtering all deleterious material from large quantities of water. Families or individuals *could* sterilize the water they drink, but the great mass of the people will not do it. Experience has taught that, during the most terrible epidemics, familiarity with danger breeds contempt for it, and the man who to-day would avoid an infected house or neighborhood, would to-morrow drink the water which caused the infection. There is, therefore, but one road to safety, viz., draw all water-supplies from unpolluted sources. But unlimited supplies of water, untainted by human excrementa, are becoming scarce indeed, and unless the suicidal policy of pouring unsterilized sewage in the nearest body of fresh water is abandoned, there will, in the near future, be no sufficient supply of pure water for many a city here.

The tendency of the age is toward great aggregations of people in towns and cities. The consequent rapid increase in urban populations—the paving and sewering of the streets of vast areas, densely peopled, in large cities—the extension of these improvements to the smaller towns and villages—the pumping of enormous volumes of water to the remotest parts, charging it with impurities, and pouring it back through sewers into the original channel, are all hastening the rapidly approaching time when pure water will be unobtainable at any cost.

It is strange that this evil should have been permitted to reach its present magnitude.

A town or village is charmingly located on the banks of a beautiful river of pure water. Its people are healthful, happy, and contented; they draw the water they drink, and much of the food which they eat, from the river. But other cities and towns are built upon its banks, and their authorities take especial pains to so construct their drains and sewers that all of the sewage is poured directly into the river, transforming it into a veritable cloaca, which meanders along amid hills and plains, past hamlet and borough, past mansion and messuage, past hovel and cabin, collecting the pestilence-bearing refuse from all alike, each stable yard, kennel, and privy vault adding its quota of pathogenic material to the stream, which is already reeking with its burden of filth, putrifying garbage, and fetid stercoraceous matter.

Presently this colluvial river reaches a fair city, with its triumphs of architecture rising from either bank, its towers and turrets piercing the clouds, which float in an atmosphere which should be sweet and salubrious, but, alas, is not. Fabulous sums of money have been expended to bring it to this state of splendor, with its parks, boulevards, viaducts, and roadways, under which are lain networks of pipes, and men of genius have erected magnificent buildings, in which are placed the master-pieces of the engineer's handiwork,—and for what purpose? That through these aqueducts, a plethora of this ordure-laden, disease-breeding liquid, may be propelled from end to end of the city, that it may be readily, and without superfluous exertion on the part of the people, quaffed when they are thirsty. Its virulence may be masked by its agreeable taste. Limpid and sparkling it may be, for the carbonic acid which is generated from the supervacaneous decomposing organic matter which it bears may give it something of the character of soda-water. It may be clear and pellucid and cold, and yet every drop of it may carry a life-destroying virus.

This fluid is also used in the lavatory and the laundry; by the stablemen to clean horses, dogs, and cows; by the street cleaner to wash the streets; sinks, closets, latrines, and drains are cleansed with it; the dirt and residuum of great manufactories, the decaying blood and offal from abattoirs; the carrion and refuse from the soaking vats of great tanneries, the virus-charged leavings of great hospitals; the drainage from worm-eaten carcasses in the cemeteries and graveyards; the scourings of morgues and the dissecting rooms of medical colleges—all of this nimiety of vileness is collected by the sewers, and carried back into the once beautiful river, which creeps along by a circuitous route to the next fair city, and the process is repeated again and again, and all who drink the disgusting fluid, expose themselves to the dangers of the diseases which afflicted those whose excrement they swallow,—and the river goes on and on, not only a menace to man and beast, but despite the tendency which running water has to purify itself, it has become so saturated with deleterious matter that even the foulest-feeding fish cannot live in it, and in many places the effluvia arising from the water is so offensive as to be almost unbearable.

My home city, Cleveland, Ohio, situated on the shore of Lake Erie, naturally one of the most salubrious cities in the world, pumps its water-supply from the lake, loads it with the excreta of her three hundred and forty thousand people, and innumerable animals, in health and disease, returns it to the source from which it came, and again pumps it up for domestic use—the water thus traveling in a never-ending circle, of which the intestinal tracts of all her inhabitants form living segments.

You will, therefore, not be surprised when I tell you that in 1895, there were in Cleveland 117 deaths from typhoid fever, and that every public faucet flows with water charged with gas-producing bacteria—which means that the product of human excrementa flows in a continuous stream through the water-mains where only the purest water should find passage.

Originally, the floor of our harbor was clean sand, over-lying clay. In 1867, it was covered with two or three feet of slime and filth. In 1896, the latter according to report had increased to from six to ten feet. These facts, together with accompanying tables of analyses of our water (for which I am indebted to Mr. Wright, director of public works, and Mr.

Charles J. Wheeler, city chemist), will show how rapidly this all-essential fluid is becoming unpotable. I shall not exhaust your patience by reading the figures, but will give you this brief summary.

ANALYSIS OF WATER TAKEN NEAR PROPOSED NEW INTAKE.

	July	*April*
Chlorine	9.51	6.05
N. as Free Amm	.050	.020
N. as Albuminoid Ammonia	.170	.125
Total Ammonia	.2200	.145
N. as Nitrates	None	.095
N. as Nitrites	None	Trace
Oxygen consumed	4.65	7.68
Total Solids	166.00	
Residue	105.00	
Loss on ignition	61.00	
Bacteria per c. c.	38.00	

I saw several plate cultures a few days since which showed an average of more than sixteen hundred colonies of bacteria to the cubic centimeter. The following tables (for which I am indebted to Charles J. Wheeler, city chemist, of the city of Cleveland,) will show the change that has taken place in the water in Lake Erie, in the vicinity of the waterworks intake. The first one was made in the Case School of Applied Science in 1887, by Dr. Albert W. Smith, and the second in the Cleveland City laboratory by Mr. Wheeler in 1896.

TABLE No. 1.—WEEKLY ANALYSES.

	Chlorine.	Free Ammonia.	Albuminoid Ammonia.
March 1	2.77	.020	.126
March 19	1.42	.018	.194
March 26	2.20	.026	.088
April 2	1.70	.032	.150
April 9	2.56	.024	.126
April 16	2.41	.030	.186
April 23	2.56	.034	.176
April 30	2.09	.082	.272
May 7	2.00	.038	.210
May 14	1.42	.036	.248
May 21	1.42	.036	.176
May 28	2.02	.020	.146
June 4	2.20	.008	.100
June 23	2.02	.006	.092

In 1887 the highest chlorine was 2.77, the lowest 1.42; the highest free ammonia was .082, the lowest was .006; the highest albuminoid ammonia was .272, the lowest .088. In 1896 the highest chlorine was 9.33, the lowest was 6.05; the highest free ammonia was .175, the lowest was .025; the highest albuminoid ammonia was .250, the lowest was .090.

TABLE No. 2.

No. of Samples.	Date of Collection.	Chlorine.	Free Ammonia.	Albuminoid Ammonia.	Total Ammonia.	Nitrates.	Oxygen Consumed.	Total Solids.	Residue.	Loss on Ignition.
930	April 6	7.80	.150	.250	.400	.135	8.51	187.	128.	59.
931	" 6	8.64	.065	.170	.235	.150	8.51	156.	116.	40.
934	" 6	6.91	.050	.150	.200	.162	4.75	164.	114.	50.
935	" 6	7.80	.175	.175	.350	.125	4.75	164.	108.	56.
936	" 6	8.23	.100	.200	.300	.135	8.84	164.	110.	54.
937	" 6	7.80	.125	.210	.335	.100	6.06	160.	113.	47.
938	" 6	7.35	.110	.200	.310	.085	9.00	133.	92.	41.
939	" 6	9.33	.085	.195	.280	.087	5.40	134.	109.	25.
940	" 7	8.23	.100	.175	.275	.130	4.75	185.	127.	58.
941	" 7	9.33	.060	.185	.245	.120	5.56	140.	92.	48.
942	" 7	7.35	.100	.175	.275	.107	7.53	180.	120	60.
943	" 8	6.91	.045	.210	.255	.062	5.07	152.	130.	49.
944	" 8	8.23	.040	.200	.240	.155	7.82	199.	168.	31.
945	" 8	6.48	.035	.190	.135	.140	4.75	160.	122.	38.
946	" 8	6.05	.025	.090	.115	.112	8.51	107.	73.	34.
947	" 8	8.23	.090	.200	.290	.175	7.82	185.	142.	43.
948	" 9	8.64	.050	.190	.240	.187	7.69	178.	128.	50.
949	" 9	8.23	.070	.150	.220	.165	9.33	154.	121.	33.
950	" 9	8.23	.055	.175	.230	.112	6.87	180.	143.	37.
951	" 9	8.64	.025	.120	.145	.122	7.86	191.	120.	71.
952	" 9	8.23	.030	.200	.230	.155	7.04	181.	150.	31.
953	" 10	6.05	.055	.175	.230	.100	4.91	151.	109.	42.
954	" 10	7.80	.040	.175	.225	.075	4.75	156.	103.	53.
955	" 10	6.05	.050	.150	.300	.060	8.50	166.	124.	42.

TABLE No. 2.—*Continued.*

No. of Samples.	Date of Collection.	Chlorine.	Free Ammonia.	Albuminoid Ammonia.	Total Ammonia.	Nitrates.	Oxygen Consumed.	Total Solids.	Residue.	Loss on Ignition.
956	April 11	9.33	.050	.165	.215	.112	8.51	203.	146.	57.
957	" 11	9.33	.045	.150	.195	.212	8.51	175.	133.	42.
958	" 11	5.18	.055	.150	.205	.060	5.56	151.	97.	54.
959	" 11	8.64	.035	.120	.155	.237	7.04	159.	115.	44.

930. 100 Wood Street.
931. Lab. Tap.
934. 415 Case Avenue.
935. 1,300 Lake Street.
936. 124 Merchants' Avenue.
937. Corner Jennings and Auburn.
938. 29 Aetna Street.
939. 1,346 Harvard Street.
940. 81 Penn St.
941. Corner Ridge and Conard.
942. Corner Perry and Orange.
943. Corner Prince and Woodland.
944. Merwin Street.
945. Corner Crawford and Milburn.
946. Corner Bell and Cedar.
947. 654 Seneca Street.
948. 954 Dennison Avenue.
949. 119 Poplar Street.
950. Corner Case and Scoville.
951. Corner Helen and W. Madison.
952. 97 Lawn Street.
953. Homer St.
954. 194 Miles Avenue.
955. Fairmount Avenue.
956. Broadway and Gallope.
957. Pumping Station Taylor Street.
958. Kinsman Res.
959. 414 Kinsman Street.

"All samples, except 946, 954, 939, 938, were very turbid, and of a yellowish color. Those taken from the districts where large quantities of water is used, were much more turbid, and of a deeper yellow color than those taken in the residence parts of the city."

"Numbers 956, 954, 938, were taken from pipes supplied by the Kinsman St. Res. These samples were very clear, showing only a slight milkiness and a good blue color. The turbidity and color were the only points in which they differed from the other samples. All the samples contained a decided trace of nitrites."

"The odor at 36 C. is indescribable, very rank. The taste at 38 C. was very unpleasant. Total solids were of a gray color, on heating turned black, and gave off an odor like burning bones. The color and odor were pronounced this month, more so than last.

"In comparing this month's analyses with those made last month, it will be seen that the chlorine, ammonia, and solids are very much higher this month. This is probably due to the high winds we had just before samples were taken. In general, it can be said that the water shows a very much worse condition of things this month than last. It has been stated through the public press that the water of the city of Cleveland is just as good as in any other large city. In contradiction of the above statement, I append the analyses which I have received from the chemists of several large cities.

TABLE No. 3.

	Total Solids.	Free Ammonia.	Albuminoid Ammonia.	Nitrites.	Nitrates.	Oxygen Consumed.	Chlorine.
Washington, D. C., 1891–1892	113.	Trace.	.064	.00	.6	1.85	4.3
Washington, D. C., 1892	89.	Trace.	.025	.00	.6	1.19	5.3
Croton water, New York	75.	.07	.08	.00	.27	......	2.2
Pittsburg, Pa., 1893	76.	.026	.154	.00	.54	......	5.8
Pittsburg, Pa., 1893	82.	......	.025	.00	......	......	7.0
Buffalo, N. Y., 1896	......	.026	.077	.00	......	5.1	5.51
Detroit, Mich	105.	.039	.083	.00	......	.575	2.37
Chicago, Ill	142.	.248	.415	.00	......	......	7.64
Cleveland water, average for April	164.	.072	.172	Trace.	.127	6.93	7.83

"Comparing the figure in the above table, it will be seen that with the exception of Chicago water all are better than our own. Our water is just a trifle better than Chicago water, but only a trifle.

"I make the following few suggestions for the interpretation of the determinations :

"COLOR, ODOR, AND CONDITIONS.

"The best water should be free from color or odor, and should be bright."

"Solids entirely depend on the source."

"Free ammonia is the product of the putrefaction of organic matter, and is evidence of contamination in almost all cases."

"Albuminoid ammonia points to the presence of nitrogenous organic matter. When ammonia is evolved slowly by alkaline permanganate it is of recent origin, of animal derivation. When ammonia and chlorine are both high, the comtamination is of an animal derivation ; when chlorine is low and oxygen consumed high, the contamination is from vegetable source. Nitrites are indicative of active putrefactive change ; except in deep waters, its presence is condemnatory unless the water is otherwise quite clean."

"Nitrates are evidence of the final oxidation of organic matter, and point to previous contamination."

"Applying these rules to the determinations which we have made on the Cleveland water, we find that the water has a very decided odor, color, and taste ; that the free ammonia is very high ; the nitrites (indicative of active putrefactive change) a very decided trace; nitrates a large amount; the albuminoid ammonia is very high; it is evolved very slowly, showing that the contamination is of recent origin. This, in connection with the high chlorine, shows that the contamination is of animal derivation. The chlorine in any locality is fairly constant; on comparing the results obtained in 1888 by Prof. A. W. Smith, with the ones we obtained, we find that the chlorine has more than doubled in the intervening time. Drinking water of cities is usually classified as pure, usable, suspicious, or impure. Taking the analysis, the close proximity of the intake to the known impure water, the dumping of large amounts of garbage and night soil into the lake where it may be driven by the winds into the intake, the nearness of the intake to the shore—taking all the above into consideration, I should say that Cleveland water came under the head of impure water, and before using should be filtered and boiled."

What similar analyses would show this water to be, in the early decades of the next century, is beyond conception, but they make it plain that we are living over a slumbering volcano, for the fertilization of these excrementa polluted waters, with the germs of malignant typhoid, cholera, or other infection (which is liable to occur at any time), might light up a pestilence, that would decimate the people, and turn the country into a charnel house; hence, I maintain that this disgusting and dangerous practice of polluting the people's water-supply must cease. But upon whom shall devolve the onerous duty of calling a halt upon this stupendous crime, and of punishing the flagrant criminals? Not upon municipal or state authorities,—their powers are far too circumscribed—for the water we drink in this city washes the shores of eight or ten, and those of the Mississippi, nearly thirty states. There is, therefore, but one power which is competent to prevent the wholesale pollution of the potable waters of the United States, because there is but one power whose authority is co-extensive with the limits of the land, there is but one power which is competent to enact and enforce those laws that shall deal out exact justice to those who are so criminally negligent of others' rights as to dump their death-dealing refuse, whether as the excrementa of an individual or the sewage and garbage of a city, into their neighbor's water supply, whether the receptacle be the Aroostook or the San Diego rivers, Lake Quianiutt, or Lake Okeechobee,—and that is the general government of the United States, and its authority can be irresistibly invoked only by the great American Public Health and the American Medical Associations, and its action can be wisely directed only by a Department of Public Health, which shall be presided over by a Secretary, whose power and influence shall be co-equal with those of the Secretaries of State, of War, or of the Treasury. The government is for the people, and can it render them any greater service than that of protecting man's dearest treasures—his life and health?

Future generations will be astounded to learn that after one hundred and twenty years of glorious achievement in all of the varied affairs of life, this government has still no official whose duty it is to guard the health of its people.

We are at peace with all the world, but we have a Secretary of War to watch over the military affairs of the nation. We are so rich that a debt of two thousand millions of dollars did not in the least impair our credit, but we have a Secretary of the Treasury to guard our monetary interests. We are so powerful that serious international complications are not likely to disturb our equanimity—yet we have a Secretary of State. We have a few war vessels from not one of which has a shot been fired in hostility for thirty years—yet we have a Secretary of the Navy. Surely the health of the people is of paramount importance to a few paltry dollars—to our diplomatic relations, to the manœuvres of the army, or to our few scattered ships.

I mean to cast no reflections upon the officials to whom I have alluded; their services are of inestimable value, but the government of the United States will not have discharged its whole duty to the people—will not have attained the zenith of its greatness, until, through a Department of Public Health, aided by wise legislation, it has taken every possible precaution to protect the health, and to foster the highest physical develop ment of her citizens, by guarding well the purity of the air they breathe, the food they eat, and the water they drink.

Moreover, until the government of the United States has exhausted every possible resource to prevent death from all preventable diseases, it is responsible under God's high law for every lost life that could have been saved.

DISCUSSION ON THE PAPERS OF DRS. JOHNSTON AND WOODBRIDGE.

Dr. Carmona Y Valle.—The paper read by Dr. Johnston relative to the diagnosis of typhoid fever by the action of the serum of typhoid patients, upon the peculiar movements of the bacilli of Eberth, and by which such movements are arrested, has been extremely interesting to me. The means described constitute a marked advance in medical science, and have certainly practical application of great importance. In my opinion, the action is exercised as follows: In general, micro-organisms have the peculiar property of forming conglomerations in the presence of a deleterious or toxic medium—that is, a medium incompatible with their existence. In such cases, these germs form conglomerations in order to avoid a general destruction by the toxic agent, that those found in the centre may escape the action of the toxin due to the wall formed by the superficial ones which have become inert.

I have observed this mode of defense on very many occasions in the case of a large number of micro-organisms placed in contact with alcohol, or subjected to the action of heat, or of some toxic substances. And this is the reason, I believe, why the bacillus of Eberth has a tendency to form conglomerations when placed in contact with the serum of patients suffering from typhoid fever, which serum contains the antitoxins that are essentially deleterious to these microbes.

I believe, in consequence, that the same means employed for the diagnosis of typhoid fever, as ably described by Dr. Johnston, may also be effectually applied to the diagnosis of other diseases, infectious in nature, caused by micro-organisms—that is, by treating a culture of the germs producing a certain disease, with the serum of an animal suffering from the same affection.

Dr. J. J. Kinyoun.—I rise only to say a few words in commendation of Dr. Johnston's results in the diagnosis of typhoid fever. About eight years ago, I commenced the study of malarial fevers as the patients came into the Marine hospital, and was able within two years to collect, by very arduous labor, eight cases of mixed infection, that is, malarial fever and typhoid fever. These came to me by accident, and I reported them in a preliminary note to our Bureau, calling attention to the fact that I did not believe so-called typho-malarial fever was gaining credence in the southern part of the United States, and suggested that the best term for these cases would be "entero-malarial" fever, where the two infections were combined. No diagnostician, simply by the aid of the microscope, dealing with these two infections, would have difficulty in making an accurate diagnosis in a short time. In the method suggested by Dr. Johnston I think we have a great help in dealing with those suspicious forms of fever that are so prevalent in the southern part of our country. Especially will this method be of practical value in the study and work now going on in Washington, where we attempt to classify the different forms of malarial infection and mixed infection between typhoid and malarial fever. If the method proves successful it will be one of the most important in the matter of accurate diagnosis and the eradication of epidemics of typhoid fever.

Dr. William Bailey.—I want to express my gratification and approbation of the paper by Dr. Johnston. Those of us who live in a more malarial district than this constantly have presented to us difficulties in differential diagnosis. There comes to us a case, and it is a week's time before we can satisfy ourselves whether it is one of typhoid fever or not, and it seems to me in this method we have a ready means of making a differential diagnosis.

Dr. Johnston.—There is one point with regard to the question of priority of this method. As I said in my paper, it was a French method, introduced by Widal. Widal's method, however, was the application to typhoid of what had already been done to cholera by Pfeifer. Pfeifer must be regarded as the originator of the method in the true sense, and Widal as the originator of the method of application to typhoid fever.

RACIAL DETERIORATION: THE RELATION BETWEEN PHTHISIS AND INSANITY.[1]

BY LAWRENCE IRWELL, M. A., B. C. L.

> MOTTO.—The time may hereafter arrive, in far distant years, when the population of the earth shall be kept as strictly within the bounds of number and suitability of race as the sheep on a well-ordered moor, or the plants in an orchid house; in the meantime, let us do what we can to encourage the multiplication of the races best fitted to invent and conform to a high and generous civilization, and not, out of a mistaken instinct of giving support to the weak, prevent the incoming of strong and hearty individuals.
>
> —*Galton*, "*Hereditary Genius*," *p. 357.*

In the numerous works upon the tubercle bacillus, many references are made to the hereditary character of the phthisical susceptibility, and it has been shown that the normal individual, although he may be debilitated by reason of unfavorable external conditions, falls a victim to the bacilli of phthisis far less frequently than does the person who has inherited the tuberculous predisposition, which, for want of a better name, I propose to call "consumptivity." While it is true that by inattention to the laws of health any one may acquire consumptivity, and eventually tuberculosis of the lungs, the inheritance of the diathesis need not necessarily involve the acquisition of the disease itself, though it often does, in consequence of the ignorance of the bulk of the population concerning the precautions which ought to be taken for the protection of the members of families in which consumptivity exists. There is not, however, any cause for alarm if suitable protective measures are adopted.

Dr. Lauder Brunton writes: "We are constantly meeting with persons belonging to very consumptive families, who escape the disease by living under conditions where the bacillus tuberculosus is likely to be absent. On the other hand, persons such as nurses are in all probability frequently inhaling the microbe, and yet are not attacked by the disease. In the first case, immunity is probably due to the absence of the seed, notwithstanding the favourable conditions of the soil; in the second, it is due to the barrenness of the soil, notwithstanding the presence of the seed."[2]

An able physician having informed me that he cannot from personal observation "verify the existence of a tubercular diathesis, except as pallor and general depression of bodily tone conduce to disease, I beg leave to quote Dr. Haycraft, the professor of physiology in University College, Cardiff, Wales:[3] "Inasmuch as phthisis is markedly hereditary, we may look upon the *type*, not the disease, as being transmitted. A phthisical type of person is one who comes of a family liable to fall a prey to this microbe, and he is recognizable by many distinctive characteristics of hair and complexion, and by qualities of temperament, figure, and feature. The phthisical are attractive in personal appearance on account of their rich skin and hair coloring, and their frequent brightness and vivacity. . . ."

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[1] A paper read before the American Public Health Association, at its meeting in Buffalo, in September, 1896.

[2] "Introduction to Modern Therapeutics," p. 15.

[3] "Darwinism and Race Progress," p. 55.

While admitting that my own uncorroborated observations may be of slight value, I claim to have the highest authority for my assertion that consumptivity is an objective characteristic, and that its distinctive features are peculiarities of complexion, hair, and eyes, often (not always) accompanied by very white teeth, which generally decay in early life, and perhaps more frequently accompanied by the weakness of intellect which I have called "phthisical mania,"[1] and which is described by Dr. Maudsley in the following words:[2]

"It is acknowledged that phthisical insanity, so called, may befall in persons of the phthisical diathesis who have no symptoms of local tubercular deposit. Without doubt many phthisical persons exhibit features of character in some respects peculiar. They are quick, irritable, fanciful, and changeable, eager in project and impatient of opposing delays, very idealistic, but unstable of purpose, brilliant in flashes, but wanting in breadth and calm depth of thought, and in methodical and steady perseverance; quick in insight and intense in energy, they see the project of the hour and press for its realization as the one important thing in the world, and in a short time, perhaps, are engaged with as eager interest and abandonment in some other project; there is something fitful in their projects, in their energy, in their displays of imagination—a sort of hectic in their thoughts, feelings, and actions."

The whole of these symptoms are not, of course, invariably present in any one individual. Let me hasten to explain that by the term "diathesis" I understand an exaggerated temperament, signifying a proclivity towards some particular disorder.

I now turn to the scrofulous condition. This is, in many instances, not only a diathesis, but a cachexia—the disease itself in a latent form. The swelling of the glands of the neck is *the* important symptom, and when it is present every diagnostician recognizes it as an indication of tuberculosis. The general appearance of persons of the scrofulous type is the very opposite of that of the sufferers from consumptivity. The true scrofulous individual is noticeable in consequence of his thick and spongy skin, his coarse features, his dull eyes. The upper lips are frequently swollen, and the eyelids, sometimes devoid of hair, present a red, raw appearance. The general expression is one of dulness. The bones are thick and heavy; the head is often out of proportion in size to the body. Offensive discharges from the eyes, nose, and ears are common. Further description seems unnecessary. I must add, however, that the intellect of scrofulous persons is usually of a low type.

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[1] Dietetic and Hygienic Gazette, Jan., 1896, p. 14.

[2] "The Pathology of the Mind," 3d ed., p. 477.

The late Sir William Gull drew attention to the frequency with which men and women belonging to families in which cancer is common beget scrofulous children; and Dr. Ireland estimated that at least two thirds of all idiots were scrofulous. Dr. Beach, of the Asylum for Idiots at Darenth, Eng., after an extended inquiry, found that phthisis, either alone or in combination with some other degenerate condition, such as insanity, epilepsy, or alcholism, was present in 50 per cent. of the parents of all idiots admitted to his asylum; and as about two thirds of these idiots are scrofulous, it seems clear that phthisis in the parent often deepens not only to scrofula in the child, but to the very lowest type of humanity—the scrofulous idiot.

It is not my intention to quote any elaborate statistics concerning the percentage of instances in which consumptivity is acquired. Having satisfied myself that many of the cases in which that derangement *is said* to have been acquired are in reality atavistic, I attach little importance to any figures upon that subject. It is asserted, however, that the family taint can be traced in from 35 to 50 per cent. of the sufferers from tuberculosis pulmonalis; and anybody possessing a very vivid imagination can doubtless convince himself that from 50 to 65 per cent. of tuberculous persons were born without any special predisposition towards tuberculosis of any organ of the body. However that may be, "a perfectly healthy individual, placed under favourable conditions as regards food, fresh air, and exercise, is never successfully attacked by the tubercle bacilli . . ."[1] In other words, nobody becomes tuberculous, in the true sense of the term, unless he has inherited or has acquired the diathesis.

And here a few words concerning atavism. Of course nobody doubts the verity of it, and I would remind you of the case of Edward Lambert, "the porcupine man," mentioned by our great master, Darwin, in "The Cultivation of Animals and Plants under Domestication," whose skin was covered with warty projections which were periodically moulted. He had six sons and two grandsons similarly affected, while the females of the family escaped, the two grandsons mentioned having seven sisters who were free from the peculiarity. I wish to place special emphasis upon the point that the peculiarity was latent in the female sex, because it appears to me to demonstrate how limited is the power we possess of exterminating pathological variations by the judicious mating of the sexes, and how essential it is, if the race is to progress, to persuade those who are abnormal to refrain from marriage.

As a partial explanation of atavism, by means of an illustration, I would say that buried seeds of plant life sometimes remain dormant for years, so that, when a plot of ground that was formerly cultivated is again deeply dug into and turned up, plants that had never been known to grow on the spot frequently make their appearance in profusion. The time at my disposal will not permit of further remarks upon atavism.

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[1] "Bacteria and Other Products," Woodhead, p. 230.

Having more than once seen assertions in print that tuberculous mothers transmit phthisis to their children more often than do tuberculous fathers, I think it well to reply that the direct transmission of tubercle bacilli by either parent is extremely rare in the human animal. It is said that the late Mr. Pasteur found the microbe of the silkworm disease known as "pebrin" in the eggs of the silkworm moth, and it is therefore possible—arguing from the analogy—that the bacillus tuberculosus may, in rare instances, exist in the human embryo, having been conveyed there by the ovum or the placenta of the mother, or by the spermatozoon of the father. For this "infection of the germ," which is not hereditary, I suggest the name "Spermiasm" (*σπέρμα*=germ+*μιάσμα*=infection). By "hereditary" I mean the transmission of a physical characteristic from parent to offspring. The apparent frequency with which tuberculous mothers transmit phthisis to their offspring is explained by the proximity of the infant to the female parent for a long time after its birth; by the continual kissing of the baby by the mother; perhaps by the presence of tubercle bacilli in the mother's milk. I do not imagine that the organisms are contained in the breath of phthisical persons, but I do suggest that particles of sputum may be conveyed by the process of osculation.

A passing notice of the question of heredity is necessary. As a member of the neo-Darwinian school of biology, I deny that "acquired characteristics" are hereditary. But, as the soma is the protective covering of the germ-plasm, it seems certain that any mode of life that has a tendency to weaken the soma will have a deleterious influence upon the germ-plasm, and therefore upon the next, or some future, generation. Any further discussion of neo-Darwinism versus neo-Lamarkism would be out of place here. I may say, however, that this paper deals specially with cases in which consumptivity has been congenital and only incidentally with those instances in which it was absent at birth.

As we do not know specifically what causes the acquired phthisical diathesis, nothing more than a general idea can be given. Lack of fresh air, insufficient nitrogenous food, absence of out-door exercise, the presence of other complaints—such as alcoholism and bronchitis—all predispose towards consumptivity. Want and ignorance among the poor, and enervating luxury, coupled with inattention to hygienic laws, among the rich, are common causes of the phthisical susceptibility, which appears to consist of a lowered vitality of the cells—often, of course, of the lungs—and consequently a lessened power of resistance against pathogenic micro-organisms. It therefore follows that, when required to defeat the attacks of the bacilli which are attempting to gain access to various cells, these cells are incapable of doing their duty, and the microbes thrive, grow, and obtain a permanent place in the tissues.

It is well known, of course, that individuals of the phthisical type are alarmingly prolific—indeed, such is often the case with degenerating forms of life. I suppose that almost every Englishman has observed that an oak tree which is about to die is usually overburdened with acorns. In Sir Francis Galton's work upon "Natural Inheritance" we find these words—"They (phthisical persons) certainly marry earlier as a rule than others, one cause of which lies in their frequent great attractiveness; and again, when they marry, they produce children more quickly than others."[1]

Dr. Denison, of Denver, in a recent address upon "Degenerative Heredity"[2] has suggested that persons suffering from consumption should abstain from marriage; or that, if they do marry, there should be an understanding that the union will not result in the birth of children; and Dr. Paquin, of St. Louis, has asserted that "the marriage of consumptives is often a deliberate creation of a pest-house."[3] These opinions are well worthy of your consideration.

Although the men and women who suffer from consumptivity are exceptionally fertile, large numbers of their children are carried off during infancy by convulsions, diarrhœa, and other complaints, so that comparatively few arrive at maturity, and hardly any reach old age. The majority of such individuals as live to puberty develop pulmonary phthisis and die before their fortieth birthday. If this were not so, racial decay would be very marked, for, as I have already mentioned, the victims of consumptivity add more than their quota to the population of the English-speaking world. It must be admitted, I think, that the condition which I have called "consumptivity" is a general degeneration, closely connected with the neurotic state; it is found in families, at one time above the lowest stage of mental and physical development, but now on the down-grade of general and rapid decay. As there are thousands of causes of degeneration in all communities, no positive statement can be made upon that subject. Cornet, however, has shown that rooms inhabited by consumptives are crowded—the walls "saturated," so to speak—with the parasites of tuberculosis, and it is possible that there are instances in which the continued exposure of generation after generation to the attacks of the tubercle bacillus may have had some influence in the production of the phthisical type.

It is an error to suppose that consumption is a disease peculiar to the poor who dwell in the midst of unsanitary surroundings. "In some families even in the highest ranks of society," writes Dr. Strahan,[4] "the susceptibility to the tubercle bacillus becomes so great that, despite all that modern science, backed by wealth, can do, the children die one after another in infancy, or succumb on the approach of adolescence. In other cases the degeneration from inter-marriage or some other cause becomes more or less mixed in character, and while some of the children succumb to tubercular disease in infancy or later in life, idiocy, suicide, epilepsy . . . will appear in others." Why is this? How comes it that our able physicians, by prophylactic injections—or other methods—are unable to cope with these conditions? The reason is that man's power is limited; he can slightly modify the cosmic process, but he cannot counteract it; and the Utopian idealists who are making such strenuous efforts to replace the laws of evolution by the dogmas of sentiment are wasting their energy, since the ultimate survival of the degenerated is contrary to the processes of Nature.

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[1] Edition of 1889, p. 182.

[2] New York Medical Journal, Dec. 15, 1895.

[3] The Journal of the American Public Health Association, Jan., 1895.

[4] "Marriage and Disease," p. 201.

Having now explained the position of the biologist, I turn to the connection between insanity and the tuberculous diathesis. First, let me once more fortify my argument by appealing to that eminent alienist Henry Maudsley, who wrote as follows:[1]

"With phthisis there commonly goes a particularly intense, impulsive, and sanguine temperament, which may breed a more insanely disposed temperament in the offspring, apart from any influence which the actual tubercular tendency may be supposed to have or to have not." I now offer the evidence of Dr. Clouston, of Edinburgh, another very high authority. Thirty-three years ago he described[2] a form of insanity peculiar to persons of the phthisical type and their offspring. At the same time he asserted that hereditary predisposition to insanity existed in seven per cent. more of the insane who were tubercular than of the insane generally. After an experience of over thirty years, Dr. Clouston has seen his opinion repeatedly confirmed, and its accuracy is now generally recognized by European alienists.

In the words of Dr. Strahan, "*that the phthisical and insane diatheses are interchangeable, is proved to the asylum physician every day.*"[3] I refrain from wearying you with further evidence; but I ought to add that there appears to be little doubt that tuberculosis is the *assigned* cause of death in from 28 to 33 per cent. of the whole number of deaths in many lunatic asylums. Dr. Clouston, however, has shown that in the Edinburgh asylum phthisis was the assigned cause of death in only a little more than one half of the cases in which there was tubercle in the body;[4] and it is not improbable that the same condition prevails in other institutions of a similar character.

This brings me to the question, What is insanity? And a very difficult question it is to answer. I find it necessary to go into this subject at some length in consequence of what occurred at a recent trial in this city. The charge was murder in the first degree. The prosecution brought from New York, at a cost of a thousand dollars, a medical practitioner who poses as an alienist. My investigation having failed to reveal any book that he ever wrote upon insanity, I must conclude that he has made no reputation as a writer. But the important point in the matter is that the cross-examination of this so-called alienist disclosed the following facts: First, that he had made no physical examination of the prisoner; second, that he had not talked with the prisoner to ascertain if he was suffering from delusions; third, that his positive opinion that the prisoner was not insane was founded upon the appearance and behavior of the accused while in court, and upon the reports of other physicians who are not alienists in the true sense of the term. These physicians admitted that they had made no physical examination of the accused. Remember, the prisoner was on trial for his life.

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[1] "The Pathology of the Mind," p. 112.

[2] Journal of Mental Science, April, 1863.

[3] "Marriage and Disease," p. 205. The Italics are mine.

[4] The records of 282 p. m. examinations were scrutinized. Consult "The Pathology of the Mind," p. 520.

What is insanity? I ask.

Lord Justice Blackburn, when a witness before a Select Committee of the English House of Commons, made the following statement: "I have read every definition which I could meet with and never was satisfied with any of them, and have endeavored to make one satisfactory to myself. I verily believe that it is not in human power to do it."

Drs. Bucknill and Tuke, in their "Manual of Physiological Medicine," (4 Ed. 1879, p. 19) say, "We believe it to be impracticable to propose any definition entirely free from objection, which shall comprise every form of mental disorder. Every definition hitherto proposed has failed either to include all the conditions under which insanity exists or to exclude all in which it does not, and the more laboriously the definition is constructed, the more decided is usually the failure."

The usual conception of a lunatic in the minds of the laity is somewhat as follows: He is generally raving, shouting at the top of his voice, and smashing the furniture. When not in this state, he is controlling himself, and in the plentitude of his cunning—for he is no lunatic if not cunning—he is lulling the surrounding people into a sense of false security, until he can get a convenient opportunity of cutting their throats. Instead of a hat he wears straws in his hair, speaks of himself in the third person, and talks in complicated parables. This description is, of course, misleading. The lunatic, in the vagaries of his mind and the extravagances of his conduct, exhibits nothing but an exaggeration of the peculiarities which every man possesses in some degree. "There is a large portion of the population of every civilized community," writes Dr. Hammond ("Insanity," p. 7), "whose insanity is only known to themselves, and perhaps to some of those who are in intimate social relations with them, who have lost none of their rights, privileges, or responsibilities as citizens, who transact their business with fidelity and accuracy, and yet who are as truly insane, though in a less degree, as the most furious maniac who dashes his head against the stone wall of his cell. To many of these persons life is a burden they would willingly throw off, if death concerned them alone, for they are painfully conscious of their actual suffering, and morbidly apprehensive in regard to the future."

An insane person may not only be in vigorous physical health, not only have his purely vegetative functions, worked by the lowest nervous arrangements in good order, may not only be an efficient artisan, a skilful billiard player—that is, have his middle nervous arrangements working efficiently—but he may be an amusing and intelligent companion, be able to conduct himself well in society, may be able to transact ordinary business, but for all that, his highest processes of all may be disordered, and he may, in a limited, but complicated, sphere of action, be insane. Cases of this character are a perennial source of wonder to the public, but it is evident, I think, upon reflection, that it is not more wonderful that there may be a disorder of the highest nervous arrangements without disorder of those *immediately* below them, than that it may exist without disorder of those *considerably* below them.

Dr. Cruse's definition, modified by Dr. Hammond, is "a psychic manifestation of brain disease unattended by loss of consciousness."[1]

I trust that in these few remarks I have succeeded in giving a general idea of the sense in which I am using the word "insanity."

The sufferers from congenital consumptivity are usually precocious during childhood, and their rapid progress in elementary education is often quite remarkable. Their liability to "colds," however, seems to interfere somewhat with regular work; and they break down under strains that would not trouble ordinary children. When the age of fifteen or sixteen is reached, their sensitive nature generally displays itself; and while, at times, appearing intellectually brilliant, this brilliancy is only present in flashes, and there is always abundant proof of the absence of that stability which indicates true natural power. After a year or two, "phthisical mania" asserts itself in the form of depressed manner, or exceptional excitability; anger about trifles; or, according to Dr. Blandford,[2] "acts of an extraordinary or outrageous nature." Then follow delusions—and almost all the victims of congenital consumptivity who have passed the age of eighteen are subject to delusions, in a greater or less degree. By the term "delusion" I mean a false belief in some idea which, as a rule, personally concerns the victim, and of the falsity of which he cannot be persuaded by any amount of evidence, demonstration, the experience of his own senses, or the declaration of others. "Delusion," said Lord Erskine, a very eminent lawyer, (1750–1823), "when there is no frenzy or raving madness, is the true character of insanity." My experience has led me to the conclusion that these delusions are due to the inability of the disordered brain to appreciate certain sensations. I venture to suggest that the physiological and anatomical defects are connected with insufficient development, or atrophy, of the convolutions.[3] An investigation upon this point would be most valuable; but it would, no doubt, be difficult to secure the cerebra of many persons, who, although presenting the phthisical diathesis during lifetime, did not die from pulmonary tuberculosis.

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[1] Hammond, "Insanity," p. 266.

[2] "Insanity and Its Treatment," p. 154.

[3] Consult Mercier "Sanity and Insanity," ps. 291–297.

I have referred at some length to the relation between the phthisical and insane diathesis, because there is a disposition in this country, not only to ignore the connection between the two, but to deny that the mental idiosyncrasies of persons of the tuberculous type are anything more than "the tyranny of coincidence."

I frankly admit that in my humble opinion no absurdity of belief, nor extravagance in conduct or behavior, is alone conclusive evidence of insanity. But the mental eccentricities of persons of the tuberculous type are quite marked. "Almost every kind of mental disorder begins with a moral alienation."[1] In these cases, the disorder usually commences, I think, with the habit of telling untruths. Of course, many perfectly sane people are disciples of Ananias; but they always have an object in view when they lie. Phthisical maniacs, upon the other hand, appear to me to tell untruths when they have nothing whatever to gain by so doing; and when remonstrated with concerning the habit of untruthfulness, they usually argue that they do not *intend* to tell untruths. In the words of Dr. Blandford ("Insanity and its Treatment," p. 154), "the disorder in the various portions of the brain reduces it to such a state that the patient is unable to see the absurdity of the explanations which he gives." I beg leave to refer you, in this connection, to Mr. Sully's book on "Illusions," pp. 316–318.

Many sane persons are firm believers in all kinds of quackery, such as Christian science, palmestry, phrenology, etc., etc. Most of these individuals credit these absurdities either because they are not sufficiently educated to enable them to distinguish between scientific truth and charlatanism, or because any easy explanation of some very complicated phenomena appeals to their untrained intellects. With the weak-minded, things are different. Any dogma, however ludicrous, always fascinates the disordered brain, provided it involves some fantastic mystery. As a rule, the mystery is apparent only to the believers in the dogma, and is dispelled as soon as the fierce light of scientific investigation is thrust upon it. Foolish as many of the extravagances to which I refer, may seem, they should be regarded with indulgence as the most harmless direction which the insane tendency can take, because, but for them, many phthisical maniacs would be actual lunatics. These extravagances are "a sort of masked madness," says Maudsley—the safety valve that saves the sufferer from the asylum.

Those of us who have argued with the victims of delusions are well aware that the result is always nil. Indeed, such must be the case, since the word "delusion" does not apply to a fallacy that can be dispelled by argument. Whoever wastes his time in attempting to dispel a delusion by means of logic will depart a wiser and a sadder man in his knowledge of the extent of mental derangement which is portrayed by a delusion of what may seem, at first sight, a very limited character.

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[1] Maudsley, "Body and Will," p. 265.

Although the minds of many sufferers from consumptivity are undoubtedly neuropathic, yet no competent observer would regard these persons as "insane" in the legal sense; and moral, combined with medical, treatment might greatly improve their condition, provided their aversion to mental exertion—a characteristic which is always present—could be overcome.

The marriage of a man of the tuberculous type with a woman of the same type is, of course, an injury to the community, and a violation of the rights of unborn children, since experience has proved that consumptivity is almost invariably transmitted. The marriage of an individual of the tuberculous type with a spouse in whose family there is a tendency towards insanity is equally reprehensible. There is nothing of the nature of an experiment in such marriages, as the result is quite well known; and while they are of extremely common occurrence, they are absolutely inexcusable, and are deserving of the strongest possible condemnation by every one who is interested in the welfare of humanity at large. No breeder of race horses would expect the progeny of a "roaring" stallion and a "ring-boned" mare to be "sound" animals, although the diseases named may not be hereditary. The tendency towards them, however, is, unquestionably, of an hereditary character.

I wish to draw your attention to the opinion of the eminent French physician, Jaccoud, as to the conditions under which persons of the tuberculous type may marry. [1] He writes as follows: "Should persons affected by the debility which precedes tuberculosis be permitted to marry? If no preventive treatment has been adopted, or if such treatment has failed to produce the desired constitutional change, most assuredly not. The effect of marriage may be to transform a virtual into a real disease, and the children born may suffer in consequence of this condition. I have seen many examples of both these facts. *Marriage should also be forbidden, even though prophylactic treatment may have produced a satisfactory result, if the predisposition is of hereditary origin.*[2] On the other hand, when such treatment has produced at the adult age, a complete constitutional change, marriage may be permitted without reservation as far as the male sex is concerned, but not without some doubt in the female, on account of the possible exhaustion produced by repeated pregnancy."

One word more before I leave this point. If men or women who inherit either the tuberculous type or a neuropsychopathic constitution should marry at all (which I deny), the second party to the marriage contract ought to be a person who is sound in body and mind and in whose family there is no suspicion of any hereditary predisposition in the direction of cancer, scrofula—or any other transmissible pathological tendency. By a "neuropsychopathic constitution" I mean a permanent condition of morbific weakness of the psychical nerve-centres, exhibited by vanity, fickleness, lack of will power, unexplained headache, susceptibility to pathological pleasures, exaggerated sexual instinct, insomnia, insane temperament or diathesis.

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[1] "Pulmonary Consumption," Lubbuck's translation, p. 10.

[2] The italics are mine.

In this connection, Dr. Maudsley writes: "Some persons who have had an insane father or mother do not exhibit any marked mental or bodily peculiarities. But although the hereditary neurosis does not display itself in them, it may still be there latent or dormant, not dead but sleeping, and may appear in a decided form in the next generation. *The more closely we study mental derangements and their causation, the more clearly we perceive the influence of hereditary peculiarities, even though these may seem to be of a trivial kind, in the production of more marked neuropathic states in the offspring.*"[1] It is the duty of physicians to recognize these facts—if they care anything for the future of the race—and to warn parents that the proposed betrothals of their children require serious consideration. Let it be remembered that pomposity and passion, as well as a hundred other eccentricities, or vices, are evidences, not of lunacy, but of the absence of true mental stability.

It is a most unfortunate fact that men and women of the neurotic type are prone by a sort of elective affinity, to seek in marriage persons who have similar mental qualities, and with whom they have a sympathy of feelings and thoughts. Wild flights of imagination and empty idealistic aspirations, such as they themselves indulge in, excite their admiration; while common sense, sober reflection, and incessant work are repugnant to their nature. Further, they generally select those external circumstances of life the influences of which are adapted to increase rather than to check the peculiar tendencies of their disposition. They do not appear to possess sufficient strength of character to enable them to make the best of whatever circumstances they may be placed in, so as to get the benefit of them in self-culture. They eagerly seek such surroundings as are grateful to them, and so intensify their peculiar susceptibility, until, in all probability, a pathological development occurs. To their children, the women of the phthisical type apply the same mismanagement as they apply to themselves; and while they may be beautiful and attractive, since they remind us of the fairies of the story books, there is no probability of their being the mothers of healthy children.[2] The English-speaking world, however, is very full of them, as it is of the men of the same type, and they all marry very easily. After marriage their good looks usually begin to disappear, and their abnormal mental characteristics become more and more pronounced as they grow older. In this country, twenty-five per cent.[1] of these women die within a year of the birth of the first baby; and although it is most unlikely that one half of the remainder reach middle life, it is nevertheless certain that they generally bear many children, *about thirty-six per cent. of whom die of tuberculosis alone before their seventh birthday.*

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[1] Maudsley, "Responsibility in Mental Disease," p. 46. The italics are mine.

[2] In "Marriage and Disease," p. 212, Dr. Strahan writes that a woman of the tuberculous type "can never be the mother of strong and healthy children."

I think it unnecessary to again dwell at any length upon the well-recognized fact that persons afflicted with consumptivity are especially liable to other complaints, such as pulmonary and bronchial attacks, and that, over and above their vulnerability to the bacillus tuberculosis, they must be looked upon as unsuited for the battle of life, and especially for parentage, which involves the multiplication of the disorders from which they themselves suffer.

I now turn to the mental condition of consumptives—those who have tubercular deposit. Nothing can be further from my thoughts or my wishes, than to create a consumptive scare; but it is necessary that the truth should be known, and the alarming tendency of tuberculosis to generate brain disorders has not received the attention to which so serious a source of racial decay is entitled.

Out of 2,380 inmates admitted to the Albert and Darenth Asylums (England), 674 (twenty-eight per cent.) showed a consumptive family history.

Dr. Klein, the superintendent of the Institute for Feeble-Minded Children in Pennsylvania, investigated one hundred families in which the cases of idiocy had occurred, *and found that there were 145 members of these families who had pulmonary phthisis.* The only cases that were counted were those of grandparents, brothers, and sisters.

Dr. Mays, of Philadelphia, is authority for the fact that the near relatives of families, in which are found idiotic children, are from eight to ten times more liable to consumption than others not so affected; he adds that "consumption appears ten years earlier in life among idiotic children than among others."

Van der Kolk, as long ago as 1869, expressed the opinion that an hereditary predisposition to phthisis might predispose to, or develop into, insanity; and Maudsley writes [2] that "when family degeneration is far gone, the two diseases appear to occur frequently, and the last member is likely to die insane, or phthisical, or both; whether, therefore, they mutually predispose to one another or not, *they are often concomitant effects in the course of degeneration.*" In the face of such evidence as this—and nothing but want of time prevents the introduction of much more of it—it is foolish to imagine that the destruction of the pathogenic power of the bacillus tuberculosus—if it could be accomplished—could benefit the human family unless, either the phthisical type of individual, the connate neurotic, and persons with neuropsychopathic constitutions can be induced not to marry, or unless those types can be effaced by the introduction of new blood. The former desideratum can, I believe, eventually be effected by the educational method. But the latter cannot be carried out by any process, because sanitary surroundings do not cause a decrease in the production of degenerated offspring by parents who present the tuberculous diathesis. Dr. Paquin has written "the marriage of a consumptive with a healthy person eventually increases each time the number of consumptives by one . . . ."[1] When we realize what the consumptive type is, viz. :—a symptom of general family decay—it seems obvious that we can no more exterminate it, than we can annihilate death itself. The law of "the survival of the fittest" can be modified, as I have already mentioned, but, it cannot be deprived of its force; and when the action of one of Nature's selective agencies appears to be nullified, another immediately takes its place. "A large increase in the diseases of the respiratory system," writes Dr. Haycraft,[2] "is due in part to the increasing number of tuberculous patients who, kept from inroads of microbes, nevertheless readily fall a prey to other affections."

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[1] In Europe the percentage is about fifty.

[2] "Body and Mind," p. 86. The italics are mine.

In brief, I claim to have proved that it is not reasonable to suppose that any process, other than artificial selection in reference to marriage, will tend towards the extinction of the tuberculous type.

I now propose to consider whether the pathogenic power of the bacilli of tuberculosis can be appreciably reduced by compelling consumptives to adopt certain well-recognized hygienic measures. While admitting that pulmonary phthisis is an infectious disease, and that it should be treated as such, I call history to witness that, valuable as sanitary precautions unquestionably are, their efficacy in the attempted extermination of pulmonary phthisis is being over-estimated. First, however, permit me to remind you once more that the incessant propagation of persons of the phthisical type is detrimental to the race, since they usually present morbid characteristics of body and of mind, apart from any proclivity in the direction of tuberculosis.

In Naples, Italy, from 1782 to about 1860, drastic measures were resorted to to stamp out this terrible disease. Every physician was fined about $200 for neglecting to report a case under his care; and if he offended a second time, he was banished from the city for ten years. The ceilings, walls, floors, doors, and windows of the rooms in which consumptive patients died were removed and burned. Bedding and furniture shared the same fate, and the dwellings could not be inhabited for a year after the death of the patient. In consequence of these stringent laws, a family with consumption in its midst was shunned, and the patient was regarded as a public nuisance. Houses in which tuberculous patients died depreciated in value and came into disrepute; and their owners were frequently ruined. But this heroic treatment seems to have had no marked influence upon the death rate from consumption; and in the face of that fact, I maintain that the proper use of spittoons, coupled with the numerous forms of antiseptiphobia in which we are now indulging, cannot be expected to produce any extraordinary results. I am aware that in the *Forum* of February, 1894, Dr. Biggs, of New York, quoted Dr. Flick's assertion that "with our present knowledge we have it in our power to completely wipe out pulmonary tuberculosis in a single generation;" but I submit that this idea is not held by modern writers of eminence of whom I mention a few, viz.:—James, of Edinburgh—"Pulmonary Phthisis," (1888); Powell, of London—"Diseases of the Lungs," 4 Ed. 1893; Williams, of London—"Pulmonary Consumption," 2 Ed. 1887; Wilson Fox—"Diseases of the Lungs," 1892. I venture to assert that the works of all these authorities—and of many others—prove that Drs. Flick and Biggs have allowed their enthusiasm to get the better of their scientific knowledge.

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[1] "Should the marriage of consumptives be discouraged?" Journal of American Public Health Association. January, 1895.

[2] "Darwinism and Race Progress," p. 62. Statistics upon p. 63.

Is it right to sanction the propagation of the species by men and women who are wanting in the highest attribute of the human family, a sound mental constitution? I put this question as one that must be seriously faced and sincerely answered sooner or later, although, so long as education remains in its infancy, people will continue to marry without any sense of the responsibility which they will entail upon those who must be the heirs of their infirmities. Men and women persuade themselves that there is in the feeling of love between the sexes, something of a sacred character which justifies utter disregard of the consequences. As a result, cold words of wisdom are treated with repugnance, and those who offer them are denounced as "violaters of the sanctity of matrimony." Admitting that my views upon this important subject are not in accord with those of the religious world, I insist that I am supported by the highest scientific authorities, of whom I quote four.

Sir James Paget, in an address upon "The Collective Investigation of Disease," said "If one could set before one's self the gravest and most important problem in all pathology, it would be that which concerns the inheritance of disease."

In speaking of insanity, the late Dr. Oliver Wendell Homes said, "the doctor should have been called in a hundred years earlier."

Dr. Maudsley, upon the same subject, has written, "if we are seriously minded to check the increase or lessen the production of insanity, it would be necessary to begin further back, and to lay down rules to prevent the propagation of a disease which is one of the most hereditary of diseases."

"The first step in the reduction of disease," says Sir Benjamin Richardson in "Diseases of Modern Life," "is, beginning at the beginning, to provide for the health of the unborn. The error commonly entertained, that marriageable men and women have nothing to consider except wealth, station, or social relationships, demands correction. The offspring of marriage, the most precious of all fortunes, deserves, surely, as much forethought as is bestowed on the offspring of the lower animals. If the intermarriage of disease were considered in the same light as the intermarriage of poverty, the hereditary transmission of disease, the basis of so much misery in the world, would be at an end in three, or at most four, generations."

The religious minister and family physician, if they will work together, can, in time, change the existing condition of affairs. All they need to do is to teach the truth, viz.—that human evolution is a part of the general evolution of the organic world, the dominant features of which are hereditary, variation, and selection. Let these learned doctors of divinity and doctors of medicine explain that, if the race is to improve, the breeding must be done by those who are "fittest" in mind and body, and not by the physically deformed and the mentally incapable. In addition, it is their duty to teach that there is, in reality, nothing specially sacred in sexual love, as many persons seem to suppose. Upon the contrary, it is an animal instinct which man shares with the brutes; and when its essential nature is understood, we shall find in it the strongest evidences of the relation between man and the rest of the organic world. Considering what a solemn undertaking marriage is, and what responsibility it entails, marital rejoicings might well be postponed until the twentieth year of married life had been passed, or, at least, until some part of the nuptial journey had been completed. But this would be contrary to the ways of the beasts, and even of the plants, for the spring melodies of the birds are their love songs, and flowers are the adornment of love. Man displays his intimate connection with the lower forms of life—a connection which he is fond of denying by aping their exaltation on the wedding day.

"Falling in love," as sexual attraction is called, is a matter of propinquity; and such persons as suffer from hereditary predisposition to tuberculosis, or insanity, or both, should keep out of the way of dangerous attraction. They should make a serious effort to cultivate the society of the strong-minded and hard-working specimens of humanity, and should shun, as they would the plague, the company of individuals whose enthusiasm borders upon fanaticism. "The same mental excitement," writes Dr. Peachey,[1] "which, produced by the noisy orators of the Salvation Army, leads the hearers to declare themselves saved, continued but a few steps further, means mental incapacity and religious mania; this, viewed from its effect upon the community as a whole, is evidenced in a wave of insanity, and history tells the same tale."

Man is an extremely arrogant animal, and he is endowed with a vivid imagination which enables him to picture to himself a wide gap—in reality non-existent—between himself and every other representative of organic existence. Having persuaded himself of the verity of this gap, he assumes that any haphazard process of the mating of the sexes, which he would not think of applying to the brutes, will answer satisfactorily when applied to the highest mammal in the zoölogical classification. Upon this flimsy fabrication he has constructed the dogma that "marriages are made in Heaven." But biologists—both neo-Lamarkians and neo-Darwinians—from one group of facts, and statistics from quite another group, have knocked down this frail structure by proving that racial deterioration has already set in. I beg permission to explain specifically. If you follow Professor Eimer and Mr. Spencer, you believe that "acquired characteristics," bad as well as good, are hereditary. Upon the other hand, if you are in accord with Mr. Wallace, the late Mr. Romanes, Professor Lankester (I omit Professor Weismann, because, while his work is of inestimable value, his views upon the origin of death, upon pathenogenesis, and upon metagenesis are not accepted by the neo-Darwinian school), you believe that congenital variation and natural selection are the determining forces in evolution. By which ever road you travel when upon this journey, your destination will be at the same terminus.

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[1] "The Humanitarian," March 1894,—p. 237.

It is not my intention to weary you with many statistics; but I venture to assert that the reports of the English registrar-general demonstrate that the deaths from constitutional diseases, in which heredity plays so important a part, are, undoubtedly, on the increase. Let us glance at a few figures. The test is absolutely fair because disorders of the nervous, circulatory, and respiratory systems, cancer, and diabetes are all included.

Annual death-rates in England per million persons living:

1861–'65.	1866–'70.	1871–'75.	1876–'80.	1881–'85.	1886–'90.
6056.3	6311.4	7199	7636.4	7531.2	7929.4

I have taken the foregoing statistics from the United Kingdom because, with the prejudice peculiar to the average Englishman, I have some doubt as to the reliability of the statistics of some other countries.

I willingly admit that the few figures which I have quoted, and the few which I am about to quote, are not likely to make any impression upon my opponents; but I submit that it is obviously undesirable for me to weary you with elaborate statistical information.

Is insanity generally on the increase in the English-speaking world? I do not profess to be able to answer this question with any degree of certainty. I propose to place some evidence before you in order that you may have some data upon which to found an opinion. I must say, however, that in the absence of uniform and reliable statistics extending over a long period of years, it is practically impossible to determine whether the number of insane persons is increasing proportionately faster than the increase in the population. At this point I think it well to quote the words of Dr. Clouston as to the connection between consumption and insanity. "It is surprising," writes this eminent alienist, "how often both diseases occur in different members of the same family. No physician in extensive practice but has met with many such families." You are aware, I am sure, that from one fourth to one seventh of all the deaths in the world in any one year are due to tuberculosis. In this country, the annual deaths from this disease number about 90,000.

In 1880, in the United States, with a population of 51,155,783, the total number of insane, exclusive of 76,895 idiots, was 91,997,—1 in 545 of the population. If idiots were added, the proportion to the population would be raised to about 1 in 297. The test of idiocy, as opposed to insanity, adopted by the United States census office, is the age of puberty, all returns of mental affections in girls under 12 years of age and in boys under 14, being classed under idiocy.

In 1890 the number of insane was 106,254, the population being then 62,654,302. The number of idiots was 95,571. Perhaps the best way to look at these figures is by comparison. The total number of insane per 1,000,000 of population in 1860 was 765; in 1870, 971; in 1880, 1,833; in 1890, 1,677. The total number of idiots per 1,000,000 of population was in 1860, 602; in 1870, 636; in 1880, 1,533; in 1890, 1,526. As you may be congratulating yourselves that insanity and idiocy are not on the increase, allow me to read the following note from the United States census of 1890: "The decrease in the proportion (of insane) from 1880 to 1890 may indicate either that there was an actual decrease or that the numbers have not been as fully and completely returned in the eleventh as they were in the tenth census." I ask you to remember that these figures refer to the individuals who were *known* to be insane. Lunatics who are cared for at home cannot be accurately counted.

In the state of New York in 1888 there were 14,778 insane persons, exclusive of idiots and epileptics. The Report of the Commission in Lunacy for the following year places the number of insane at 15,507, and the number of idiots at 7,200. Upon page 75 of the report, the commission expresses its inability to state whether or not the number of insane is increasing proportionately faster than the increase of the population. The concluding words are, "There certainly has been a numerical increase of the insane each year for a long period of time." The United States census of 1890 fixes the number of insane in New York state at 17,831, and the number of idiots at 7,337.

I now turn to Great Britain. In the new edition of Johnson's Cyclopædia (vol. 4, p. 606), Dr. Hammond writes: "There is no reason for believing that insanity is more common in England than in the United States; but it is very certain that the registry in the former country is much more thorough."

In 1859 the number of insane in England and Wales was 36,762; in 1889 it had risen to 84,345, or from 18.67 to 29.07 to every 10,000 of the population; and in Scotland, from 6,413 to 11,954, or from 19.8 to 28.9 per 10,000 of the population in the same time. Dr. Clouston wrote in

1891: "But this increase does not prove a real increase of lunacy. For if we take the newly registered cases of the disease each year, and compare their numbers with the population, we find that it has only risen from 4.5 to 6 per 10,000 of the population in Great Britain in thirty years. There is in fact no proof that insanity as a whole is increasing; certain forms are no doubt increasing, and presumably other forms are diminishing in amount."[1]

In 1892 the number of lunatics and idiots in England and Wales was 87,848; in 1893 it had increased to 89,820; in 1894 it had again risen to 92,067.

The deaths from suicide in England and Wales in 1864 were 1,340,—64 to the million; in 1875, 1,601; in 1880, 1,979; in 1885, 2,007; in 1888, 2,308, that is, 81 to the million,—an increase of over 32 per cent. in twenty-five years.

Dr. Clouston appears to reconcile the fact that suicide, which is an unmistakable sign of the insane temperament, is increasing, with his assertion that insanity generally is not, by the assumption that some other form of brain disorder is decreasing.

For my part, I confess my inability to accept his views in toto; and, in any event, these two facts remain: First, that the percentage of registered insane persons has increased by about 12 per 10,000 inhabitants in thirty years; and, second, that death by suicide has also increased by about 33 per cent. in twenty-five years. Of the insane who are attended to at their homes, and of attempted suicides, we have no records.

"It is generally supposed," writes Dr. Harcraft,[2] "by the members of the medical profession that insanity is on the increase, and this is in accordance with the fact that deaths from several diseases of the nervous system are on the increase, too. The supposition has, however, been hotly disputed, and may be left in other hands for final settlement, for it must be remembered that our statistics date back but a few years, a day as it were in history, and we must not presume to be able to settle offhand every problem that arises."

I am not a physician, but I am very confident of my ability to fully justify my assertion that there is no dyscrasia in which heredity transmission plays so important a part as it does in criminality, inebriety, and lunacy.

The intimate connection between alcoholism and tuberculosis requires little comment, as it is generally recognized. I read you the words of Dr. Williams ("Pulmonary Consumption," p. 84): "My case books contain numbers of records of publicans, barmen and barmaids, and especially of commercial travelers, whose habits of excess in this direction are notorious, and the greater part of these have consulted me for the lesions of consumption. It is probable that the number of deaths from consumption among drinkers would be greater were they not carried off earlier by the more immediate consequences of their habits, such as delirium tremens, gout, kidney and liver disease, and insanity. It is extraordinary how easily in the lungs of topers the tubercular masses break down, and how rapid the course of the disease proves." If there are any imitators of Rip Van Winkle present, who still suppose that ethyl-alcohol in the form of wine, ale, or spirits is beneficial to consumptives, let me remind them of the assertion of Dr. N. S. Davis, of Chicago ("Consumption," p. 124), that "statistics have been gathered which show that those consumptives who use liquors live, on an average, some months less than those who do not."

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[1] Chamber's Encyclopædia, "Insanity," vol. 6, p. 158.

[2] "Darwinism and Race Progress," p. 72.

Let us now make a brief inspection of the instinctive criminal class. The representatives of this class are often deformed, deficient in energy, sluggish, and peculiarly susceptible to scrofulous tuberculosis, to epilepsy, and to the violent form of insanity. The instinctive criminal belongs, of course, to the "unfit" portion of the community; he is the personification of *mens infirma in corpore infirmo*, and one would naturally expect that he would die from either tuberculosis or nervous disease. Do not forget, I beg you, that we are dealing with the members of degenerate families. I refer you to Mr. Bruce Thompson's work on "The Hereditary Nature of Crime," and to Mr. Havelock Ellis's book entitled "The Criminal."

Consumption prevails in prisons to a truly enormous extent. The figures, of course, vary very considerably. According to Drs. Baer and Cornet, the deaths from consumption in the prisons of Austria and Prussia range from 45 to 61 per cent. of all deaths. In the French prisons, especially in the long-term institutions, the death rate from phthisis amounts to between 30 and 50 per cent. of the death rate from all causes. In England, the prison mortality from phthisis is more than twice as great as is that of the general population, which is about 3 per 1,000 inhabitants.

Cornet directs attention to the fact that the mortality in prisons from tuberculosis between the ages of 20 and 40 is five times that of the general population at these ages. The average mortality from tuberculosis in prisons throughout the world varies between 40 and 50 per cent. of the whole number of deaths. I refer you for full details to Hirsch's "Handbook of Geographical and Historical Pathology."

Von Ziemssen, in his little book upon "Tuberculosis," published in 1888, makes the following remarks (p. 73): "At Plötzensee (a penitentiary near Berlin), from 1873 to 1882, one hundred and thirty-nine prisoners died from phthisis, and besides, forty consumptives were liberated. Almost all prisons give a like proportion. Yet these figures are not high enough, for post mortem examinations of convicts who had died from other diseases showed in most cases a more or less developed tuberculosis. Baer states as the result of his experience as prison physician that *it is an exception to find in the post mortem of prisoners the lungs free from tuberculosis*." (The italics are Von Ziemssen's.)

"Among the inmates of the Elmira Reformatory," remarks Dr. Wey, "the greatest physical deficiency and least resistive power is found in the respiratory organs. Pigeon-breasts, imperfectly developed chests, and stooping shoulders abound. During a period of eight years, with 26 deaths, 13, or 50 per cent., were from diseases of the chest, not including affections of the heart."

These figures are not large enough to convey much information. Does Dr. Wey mean that there were only 26 deaths at the Elmira Reformatory in eight years? My excerpt is taken from Mr. Ellis's book, "The Criminal," and it seems probable that it contains some typographical error.

The analogue of the male instinctive criminal of the petty type is the prostitute; and I believe that tuberculous parentage can be shown in about forty per cent. of prostitutes. I have little doubt that alcoholic parentage also can be traced in a very large percentage of women of this class. Bear in mind, I ask, that the tubercle bacillus has a decided preference for those who are bankrupt in energy from any cause, except perhaps old age.

There is at our disposal a considerable amount of scientific evidence, the accuracy of which must be recognized, whether any attention is paid to it, or not. The following facts are a small portion of that evidence.

A pathological degeneration of mind takes place in one generation, and is increased in each succeeding generation. The commencement may perhaps be nothing more than irritability and occasional violent outbursts of temper upon some trivial provocation. A careful investigation of the causes of the phenomenon will often (not always, of course) bring to light tuberculosis, or consumptivity. If unchecked by accidental regeneration through suitable marriages, the fifth generation of a family of this class is usually conspicuous by the presence of idiots, or deaf-mutes, or persons whose chief amusement is attempting to commit suicide. Many of these families, as would be expected, become extinct long before the fifth generation from the commencement of the insane neurosis has been reached. I have written "accidental regeneration" because, while it is obvious that nobody who was interested in the breeding of any of the lower animals would think of breeding from a stock that was wanting in the highest characteristics of the species, yet designed regeneration of the highest animal, man, by means of his own forethought in reference to marriage is virtually unknown.

Further, suitable marriages will not invariably improve the race, because, as I have repeatedly insisted, we are unable to "breed out" certain pathological variations. Some degenerate characteristics are transmitted with marvelous certainty in spite of all our efforts. The tuberculous proclivity is one of these; and the mating of a healthy spouse with a person of the tuberculous type does not even tend towards the disappearance of that type. Permit me to give another example of our inability to "breed out" a pathological condition. The abnormal tendency to bleeding, known as "hæmophilia," which seldom actively affects females, is transmitted with remarkable certainty to the male children of mothers in whom the character is latent. The diseased condition may remain dormant through any number of generations of females, but it almost always reappears as soon as a male child is born to the family.

Again I venture to think that color blindness is another instance of a disorder which often remains dormant in females, but which is very liable to make its reappearance at any time in the male sex. As, however, little attention was paid to color blindness until 1774, when Dalton, the celebrated chemist, discovered that the leaves of the trees and his own University gown—in reality scarlet—looked alike to him. I am not prepared to positively assert that inability to distinguish colors is a sign of family decay. According to Holmgren, quoted by Mr. Ellis in his book upon "The Criminal," color blindness existed in 5.60 per cent. of 321 criminals—the sexes are not mentioned—while among 32,000 of the ordinary population the proportion was scarcely 3.25 per cent. Color blindness to red and green exists in about 4 per cent. of men, and in only about one fourth of one per cent. of women.

Looking at the whole of the facts must, I submit, convince any impartial observer that racial improvement, or the reverse, is due to selection, no other process having any appreciable effect; and unless we arrange that each generation of infants shall be the product of the "fittest" portion of the community, all our efforts to aid humanity will be of little avail, as far as posterity is concerned. The amelioration of the condition of the individual is not beneficial to the race, if the degenerated reproduce their species—as they are doing—in greater numbers than the "fit" class reproduces its kind.

The era has now arrived when the reason of the scientific investigation should supplant the ipse dixit of the orthodox doctrinaire. Unless we are prepared to allow our race to retrogress, our knowledge of the laws of organic evolution must be applied to the human family by means of the process of artificial selection. In other words, marriages must be contracted with a view to the welfare of posterity; and sexual selection which, with pecuniary arrangements, is now the dominant feature in matrimonial alliances, must be relegated to the second place. Let all men and women, old and young, who contemplate marriage seriously ask themselves this question—Will the human family be improved by the addition of more individuals like me? If the questioner is of the tuberculous type, or is a sufferer from a transmissible neurosis of any kind, there can be but one answer, viz.: No; emphatically, no. And here I add a word of warning. If the coming generation systematically refuses to accept the teaching of experience by adopting the process of artificial selection, racial regeneration is very likely to be brought about in the course of time, by a much more drastic and a far less desirable method. Admitting that public opinion is not yet ripe for any legislation prohibiting parentage upon the part of those who are mentally or physically defective, and whose fertility is an important source of racial deterioration, there are, nevertheless, signs that the burden of supporting the criminals, paupers, and lunatics—most of them sufferers from hereditary predisposition—is becoming so intolerable that segregation by legislative enactment may eventually become a necessity. Permit me to read you the words addressed to the American Medical Association at Atlanta last May, by Dr. Wilmarth of Norristown, Pa. "The growth of the burden on the industrious of supporting the helpless and the worthless may be better realized when we find that the New York State Board of Charities and Correction expended nearly $8,500,000 in 1880, and nearly $16,500,000 in 1890, although the population in that decade increased less than 20 per cent. Do you realize," asks Dr. Wilmarth, "that the taxpayer may support, during a life of ordinary duration, members of three generations of these defectives?"

I now leave this subject which deserves the most serious consideration of all thinking people. Not one word can be said against the enlightened form of egoism which we call "altruism;" but if our race is to prosper, the degenerated types of humanity, whose lives are prolonged by the scientific modification of the cosmic process, must make a sacrifice in the interest of the community at large by refraining from the reproduction of the species, so that man's forethought will act in the civilized world in identically the same manner as the laws of nature acted prior to the dawn of civilization.

[Since my paper was written I have seen an article upon "The Continued Increase of Cancer," written by an English surgeon, Mr. Roger Williams, of Preston, and published in the *British Medical Journal.* Mr. Williams says, "It seems to me exceedingly probable from considerations derived from the study of the family history of cancer patients, that a large proportion of those saved from tubercle eventually perish of cancer and insanity, and that the increase in the latter diseases has been largely brought about in this way."]

JOURNAL

OF THE

American Public Health Association.

ANNUAL VOLUME, NO. XXII. OCTOBER, 1897. QUARTERLY SERIES. VOL. 3, PART 4.

The American Public Health Association is not responsible for the sentiments expressed in any paper or address published in this Journal.

PULQUE AS A PROPHYLAXIS OF SCURVY IN PRISONS.[1]

By Dr. FRANCISCO MARTINEZ BACA,
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It has constantly been the tendency of mankind to avoid the evil rather than afterwards apply the remedy. Should our woeful experiences always lead us to the perfect knowledge of the causes by which they are produced, our inductions, elevated through the positive method, to the rank of general principles, would now have become indefectible laws, and there would not be a single page in the great book of Nature from which human mind after careful reading had not derived profit to secure actual happiness so much longed for since the most distant ages.

Death would not surprise man in the midst of the sweet home life, neither would it snatch from a loving mother's lap the tender child, a fruit of chaste love and a victim of the Leffler bacillus not yet controlled by prophylactic means.

But natural sciences with the means they dispose of, like the Voltairean *micromegas* which through a thousand senses was able to discover three hundred properties in matter, still suspecting that there was something to be known and feeling an inexpressible anxiety which admonished him of the existence of beings superior to himself; availing themselves of the microscope, an inexhaustible source of discoveries, which in the hands of the illustrious Pasteur and so many wise men whose intellect has spread vivid light, and torn off many a secret from Nature, those sciences, I say, have drawn away the veil that covered the microscopical world, allowing us to see many hitherto invisible beings, and teaching us by means of experimental physiopathology, the pathogeny of many a morbid state, have pushed forth the universal principle of inductive logic: *nullus est effectus sine causa.*

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[1] Read before the American Public Health Association, Buffalo Meeting.

Keeping away diseases rather than struggling against them, subtracting man from the evil before it comes on him, making the generations outlive, and, in short, preserving health is not only to comply with the precepts of hygiene, but to work for the future of present people and coming societies, accepting the positive form of the old philosophical principle *mens sana in corpore sano.*

As social life grows complex, industry diversified, and population becomes denser, there is an outbreak of a new group of pathogenical causes that call for preventive medicine and require from the government multiplied care in favor of the social aggregates.

If all the ramifications of public health were conveniently attended to; if such edifices as prisons, hospitals, quarters, schools, etc., were built after the clever direction of the hygienist, the burial yards would receive much fewer numbers, and the long life of citizens would do great honor as well to the governments as to the prophylactic means which science keeps at hand to prevent the annual invasion of epidemical diseases.

The Indian races mostly fill our prisons and it is well known how bad are the hygienical conditions in which they live, not only the private ones, but those referring to the *medium* in which they are born, they live and die. These circumstances render them less apt to counteract the action of morbid elements and to withstand the misfortunes in that probably last and necessary dwelling of theirs.

The predisposing and determinating causes of scurvy are known to all my fellow-professors who now do me the honor to listen to me. You also know the different causes assigned to the efficient cause of the complaint, but howsoever well known, the etiology thereof has remained in darkness when the question has been to determine in a precise manner the genesis of the morbid element.

Some hygienists think the exclusive animal diet to be the cause of it. Others say that it is owing to the lack of vegetable food, the excess of chloride of sodium, absence of potassium salts, to the water being no longer potable on account of having been stored for a long time as it occurs in long trips by sea, to intense cold or excessive heat; but most of them are of opinion that deficient food is the principal cause of this terrible plague. Scurvy, assuming the epidemical form, attacks large masses of people confined to narrow and badly-ventilated precincts, such as quarters and prisons, as well as armies exhausted with fatigue and unable to repair physiological loss.

Hypertrophy, among several other causes, plays an important part in the pathogeny of scurvy and largely contributes to the development of the disease; that is why old persons and also those exhausted by former complaints are the first victimized.

A physico-chemical hypothesis worthy of being taken into consideration, discovers some physical and chemical alterations in the blood, and in some measure enables us to learn the cause of the evil which we endeavor to prevent.

According to the analyses made by Becquerel on the scorbutic blood the amount of iron which it contains is less than in normal conditions. Fritz and Duchek noticed this fact too; only they found it contained iron almost in normal proportions.

Gabarrot, after having practised an analysis on scorbutic blood, found out the potassium salts highly diminished, and on this fact lies his etiological theory on scurvy; but on the other hand, Chalvet's chemical analyses evidently show the diminishing of red globules and mineral matter.

To explain the alterations of the blood and the chemical elements thereof, shall we suspect the existence of micro-organical elements?

Hayem and Leven noticed no alteration in the blood during the scurvy epidemy in the year 1871, when making microscopical researches in order to give an account of them to the Paris Academy of Medicine. Laboulbene, in different microscopical analyses which he made in the same epoch and to the same purpose, evinced there was a considerable increase of white globules.

Science has hitherto remained mute; but will make known to us the micro-organisms, the attacks of which we must prevent by struggling against them with the certainty of general facts based on scientific principles and not with the hesitations and fears shown by empiricism.

During the winter, 1892–93, when the sanitary conditions were scarcely defined in the penitentiary of the state which I now represent, the average of minima temperature being 8° C. and maxima 15° C., the atmospherical pressure from $591^{m. m.}$ to $594^{m. m.}$, the air minimum humidity 47 and the maximum 75, and a poor alimentation of the inmates occurring at the same time, there was an outbreak of scurvy, attacking large numbers.

I take the liberty, gentlemen, to enter into some historical considerations, perhaps touching clinical boundaries, but necessary to the clear understanding of the present subject.

The City of Puebla lies at 19° 2′ lat. and 0° 56′ E. long. of the meridian of Mexico, at an altitude of $2,169.66^{m.}$ above the level of the sea.

The place I am going to refer to, and where I carried on my inductive experiments, is the state penitentiary, which is situated on the western side of the city, in which at the end of 1893, the epoch of the second scurvy epidemy, there were 325 inmates who were attacked in a proportion of 37.75 per cent.

The Indian races, as I said before, fill our prisons, and differ from the *mestiza* in muscular force and from the Europeans in frugality, ruin their organism by overwork, bad ventilation of their dwellings, poverty of dress and remarkable proliferous power. They are, therefore, the prey of tuberculosis and in general of all dyscrasical diseases, and the supplies of inmates for our prisons and quarters. They are destroyed by the endemical, epidemical, and sporadical diseases that afflict our vast and beautiful territory.

Under such physical conditions and when the inmates were depressed by homesickness, the epidemy appeared without my being able to prevent it; but on the other hand it left me useful knowledge for further medical practice and positive experiments. That was an epoch of struggle and grief not only for the old man bending under the weight of years, weakened with deficient food and shivering with cold; but for the man who, though compelled to promote sanitary conditions in the penitentiary, found himself without means to carry out his purpose. The foe was invisible but sure in attacking, and invaded more and more my dominions, notwithstanding all the resources I tried against it. By that time I was furnished with a weapon.

Then Dr. Manuel Vergara, assistant physician of the Anthropological Department in the penitentiary, suggested to me the idea, which he had previously taken from the "International Cyclopedia of Surgery", of administering *pulque* to the patients. I duly appreciated the hint and at once prescribed the national drink to all the inmates. This was intended, on the sound people, to make up for the deficiency of ordinary diet; but, guided more by economy than by therapeutics, I prescribed the *pulque tlachique* which is far cheaper, being imported from the southern districts of the state. The daily allowance was from 250 to 300 grammes, taken all at once between eleven o'clock and noon.

The faces of the inmates shone with the hope they entertained that their liquor might restore their health, and they drank it with avidity feeling that it repaired their lost strength.

In a short time afterwards, I began to observe that the general weakness, equimotical spots that were the sign of intracellular hemorrhage, the fungosity and exuberance of the gums which kept the patients from closing their lips, gradually disappeared. The process was slow but not so much as to hide the good results derived from the mentioned drink, making me entertain great hopes of overcoming such a painful situation. It also came to my notice that the number of patients decreased and that a week had scarcely elapsed since I began to employ the *pulque tlachique*, when no more patients called for consultation.

I kept on the same treatment and before thirty days I had completely succeeded. Ever since scurvy has found the doors closed. Notwithstanding the fact that food and clothing have been considerably improved, that dyscrasy attempts to prey on those weak and accumulated people bound to each other by the ties of misery, vice, and crime. But trusting to obtain a victory, no sooner do the muscular pains and the redness of gums begin, than the national drink (produced by the maguey or Agave Americana) makes the evil disappear.

The prophylaxis of scurvy in the state of Puebla prisons and perhaps in those of the whole Republic is thus secured; but it is only equitable to say that Doctor Perin was the first in administering the juice of the Agave Americana as a cure for scurvy.

He has tried it and claims it to be superior to all other antiscorbutic specifics. So he says in his Medical Statistics of the United States Army, from 1839 to 1854.

In view of the most accepted theories regarding the pathogeny of scurvy, attributing it to the diminishing of potassium and sodium salts, I think it proper to make a slight study of our national drink, based on the excellent work of Dr. José G. Lobato, who chemically studied the various products of *maguey* and analyzed the *aguamiel* (juice of the maguey) and *pulque.*

The prophylactical properties of said liquor may be judged when we consider how similar its contents are to those of the blood.

"*Pulque*," says Dr. Lobato, "is a kind of acid wine, unrectified, produced by the fermented juice of the *maguey*, and which contains water, alcohol, sugar, mucilage, salts, and special acids which are produced through the transformation of the elements of *aguamiel* and of the essential constituents of *maguey*."

This liquor is produced, as is well known, in most of the states of the Mexican republic. It varies according to the various plants where it comes from, but the one elaborated on the Mesa Central as in the plains of Apam, Tlaxcala, and Puebla, etc., is the best, as in those places grows the best maguey, producing very good *aguamiel.*

In the southern districts of Puebla, owing to the hot climate, only the *tlachique* is elaborated.

The *aguamiel* is directly extracted from the *maguey* by scraping it. It is a white yellowish liquor, slightly viscid, with an aromatic smell due to an essential oil, with an agreeably sweet taste.

It contains, as per analysis made by Dr. Lobato, on the samples obtained from the above-mentioned places, water, essential oil, agavic acid, agavic honey of a special odor and with an acid taste, gum, starch, resin, vegetal albumen, salts, and cellulose. Not all *aguasmieles* are equally rich in sugar and gum, which are the indispensable materials to produce *pulque.*

Aguamiel, on account of containing a large percentage of sugar and gum, easily ferments after a few hours' exposure; spontaneously fermenting at from 18° to 20° C., developing agavic acid as it comes in contact with the atmospheric air, which transforms sugar into alcohol.

"This uninterrupted fermentation of *aguamiel* originates chemical transformations which never stop, but keep on to the acetic fermentation which transforms alcohol into acetic acid; then comes the lactic, and lastly the putrid fermentation."

That is why it is so difficult to preserve *pulque* for a long time, unless through the aid of antiputrid substances, such as salycilic acid and others.

Dr. José Barragán, a distinguished naturalist, assistant of the class of natural history in the National School of Medicine of Mexico, published a work on the fermentation of *pulque*, wherein he attributes the molecular motion developed in the sap of maguey, to a plant of the genus *criptococcus* endowed with an extraordinary resistance to dissolution even in as powerful reactives as nitric and sulphuric acids and acid nitrate of mercury.

Shall we regard this plant as opposed to the vitality and proliferation of the bacteriological elements that most likely exist in the scorbutical blood, and hence the prophylactic power of *tlachique* and even of simple *aguamiel* in the first period of alcoholic fermentation?

It may be so, and perhaps we shall not have to wait very long before science, with the aid of the microscope, confirms this daring conjecture which I so timidly lay before this respectable assembly.

I said formerly that the acceptable pathogenic theory proposed by Gabarrot, in connection with scurvy, was that this is caused by the diminshing of potassium, sodium, and iron salts, and perhaps also albumen contained in normal blood. Now, then, from the analysis made by said Dr. Lobato on the incinerated residuum of 500 grammes of *aguamiel*, we can see it contains, in various proportions, the following salts, viz.: sulphate and phosphate of calcium, agavates of calcium and sodium, carbonate of sodium, chloride of sodium and magnesium, sesquioxide of iron, albumen, and silicic acid.

If the lack of most of these salts in the blood determines the scorbutic manifestations which we all know, then using the maxim "*sublata causa, tollitur effectus*," is it not reasonable to admit that by introducing in the blood the salts, the lack of which causes the evil, we will settle the equilibrium of the organical liquids so that they perform their endosmotical and exosmotical functions, thus preventing the invasion of the complaint which otherwise we should have to attack?

I think this theory to be more acceptable, as it agrees with our present knowledge, and upon this I base the prophylactic power of *tlachique* which contains in more or less different proportions the same salts.

The distinguished hygienist, Dr. Lobato, ends his well-written work with these masterly words: "From all facts transmitted by observation and experience, we must come to the conclusion that *pulque* is a nourishing beverage, a tonic of the nervous system and general economy, regenerating blood and containing salts which can cure some complaints, and carbonic acid which determines many effects favorable to digestion."

I will not fatigue any longer the kind attention of my illustrious colleagues, nor go beyond the limits marked by the regulations of this honorable assembly, respecting the reading of memoirs; but before I relinquish the time so kindly granted to me, allow me to state frankly that I pretend, by no means, to have brought among you anything new. I believe that in the privileged intelligence of my illustrious countrymen, the idea of the prophylactic properties of *pulque* against scurvy had already germinated, based on the facts they have been able to induce from a long experience. It has been my intention only to offer my observations to corroborate your experience, and to insist once more on the importance of public hygiene.

NOTE.—While printing my work, I happened to peruse Dr. Gaviño's well-written, hygienical, bacteriological study on pulque, published in the "Revista quincenal de Anatomía Patológica y Clínica Médica y Quirúrgica de México." Vol. I, No. 8.

In the first theory which I so reservedly laid, referring to the fungus criptococcus of Dr. Barragán, found by him in *pulque*, I affirmed the antagonistical power of this fungus "against the vitality and proliferation of the bacteriological elements which, most likely, exist in the scorbutical blood."

The excellent work of Dr. Gaviño, who discovered thousands of microbes in *pulque*, encourages me to hope that the above stated theory facilitates my investigations. Just the same as in the microscopic world, the universal biological law of the struggle for life is imperative, giving the triumph to the stronger over the weaker, in the micro-organic world this law has no exception, and it is probable that some of the bacteriological colonies which we introduce into the economy by drinking *pulque*, struggle against those existing in the scorbutical blood, overcoming them as the former are under fitter conditions,

MIASMATIC FEVERS IN THE STATE OF SONORA.[1]

By Dr. ALBERTO NORIEGA,
Mexico, Mex.

I have the honor to submit the following report, as a representative from the state of Sonora, Mexico, to the next session of the American Public Health Association of the United States, Mexico, and Canada.

Although my contribution is a very small one, I have been anxious to do it, and I selected for my purpose a short study on the origin, treatment, and on some of the peculiarities of the symptomatic characteristics which the fevers from miasmatic origin in the state of Sonora are accompanied, and on several of the prophylactic measures to be taken in order to try to prevent the spreading of the disease.

Almost all of the inhabitants of the small townships, farms, etc., located on both banks of the Sonora river, are devoted to wheat raising, and in order to water their lands, they build reservoirs, either by means of dams and borders where the deep waters become shallow, or by means of cuts and channels to bring the water to the lands to be irrigated. Near all those large reservoirs small ponds or pools are formed. In the raining season, from July to October, the level of those waters is higher and the paludial miasma production and its spreading up is much more difficult. Although the level of the water is lower in the winter time, the water surface gets frozen so the miasma production is in a very small quantity.

Once the level of the water being so low, when the spring comes a great portion of the vegetable lands is left saturated with moisture ; the high temperature of the spring in that country acts upon the organic detritus, and while altering them, slowly aggravates the production and the spreading up of the miasma, and the miasma itself increases its virulent power as soon as the waters get on a lower level and the summer high temperature comes nearer; the endemo-epidemy develops by that time every year. The different localities on both banks of the river being subjected to these telluric-atmospherical conditions, we find the same symptomatic forms in fevers having a miasmatic origin, which differ in their peculiarities from those described by the authors who have studied them in the localities where they reign.

In all forms of the disease, the commencement is a sudden one, without any prodromes, and occasionally the patient suffers of a light disquietude, very well noted in children. Generally the initial period of chilliness fails to appear, and exceptionally some one of the patients should have it, but in such a light way that it is not in proportion with the severity of the access. Sometimes, and occasionally also, all the symptoms of a real feverish gastric catarrh appear instead, and vanish as soon as the access establishes itself. The same thing has been observed in relation to the sweating period, as no patient passes through it. In the frank intermittent accesses, the skin is occasionally covered with moisture, without this moisture being a true sweat characteristic to the last period of this kind of a fever.

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[1] Read at the Buffalo meeting of the A. P. H. A.

In the winter, the production of the miasma being in small quantities and these being attenuated by the low temperature, we find one or a few sporadic cases and less intense. The most usual form of these fevers in the summer is the continuous one, and in order of frequency, the remittent or intermittent form, with inclination to become continuous ; all of these fevers extend their hyperpyrectic period without losing their typical form until they become a continuous fever.

When the fever belongs to the continuous form in the beginning, it seems as if the palludic poison should have been slowly accumulated in the system without being noticed, and suddenly would make itself known outside, reaching at once the extraordinary temperature from 41° to 42.5° centigrade, and sometimes higher when the patient is not fortunate enough to have on hand any medical attendance, as just happened in case of a lawyer (Señor Rodriguez), who had the enormous temperature of 43.8° centigrade in his agonic period. As it may be supposed, the continuation of these terrible temperatures causes every kind of visceral congestions, the most frequent and dangerous of all being the encephalic congestions. We have had several cases of children who acquired a partial paralysis, accompanied with cast in the eyes, and some of them with partial thosis on the upper eyelid.

Incapable the quinine salts, even administered in hypodermic injections, to master the immediate danger, it is necessary to recur to baths given at 37° centigrade, and this temperature being maintained by means of cold water poured as soon as the water of the bath in contact with the body of the patient becomes warmer. We prefer this temperature and not a colder one, because we have noticed that this will give a feeling of comfort when the patient gets out of the bath, being in a state of collapsus very likely due to the rapid uncongestion of the nervous centres and to the commotion that the nervous system suffers when the temperature becomes suddenly low. The patient could not stand this collapsus if the baths should be given to him at intervals shorter than an hour, as it has happened in many cases.

It is possible to get control in a few days of this desperate state of things by means of baths and quinine administered by the way of the stomach, the treatment being different in each patient. After the hyperpyrectic temperatures are dominated, the patient continues with a moderate temperature of 38° centigrade to 39°, always on the continuous form, the thermometer hardly showing any fluctuations from one to three tenths of a degree. It is a curious thing to notice that mostly in all the patients, after having a moderate temperature for several days, an exacerbation comes at once, reaching the 40° point and sometimes higher. This rising in the temperature is like the last exertion of the morbid element against the organism, but usually lasts but few hours, and decreases, taking the form of a remittent fever and afterwards going back to its commonest type of a frank intermittent fever, always the chilliness and sweating periods failing to appear. This form is without any danger, and soon disappears entirely. The average of its durability is from 15 to 20 days, and in the most rebellious cases up to 40 or 60 days.

The state having very reduced resources to undertake the necessary work in the line of sanitation, we propose, with the idea to diminish in some way the spreading of the disease caused by the palludic miasma, the following prophylactic measures:

1. The planting of thick woods around the townships with the purpose to suppress the palludic miasma when the trees grow.

2. The houses ought to be built on the highest places, in order to keep them as far as possible out of the reach of the gases from the pools and marshes.

3. The front of the houses must not face the direction of the dominant wind, and if possible the houses themselves must avoid being in the way of the winds coming from the pools.

4. To avoid the watering of the floors, in order to maintain the interior of the houses as dry as possible.

5. The workmen in the fields must not commence their work until the sun is way up, and they must retire from the fields before the sunset.

SHOULD MEASLES BE QUARANTINED?[1]

By HENRY M. BRACKEN, M. D.,

Professor of Materia Medica, Therapeutics, and Clinical Medicine,
University of Minnesota.

Quarantine against disease among human beings is carried out in one of two ways: First, by complete isolation of any person suffering or convalescing from an acute contagious disease; second, by isolating a dwelling in which a contagious disease exists.

To accomplish the first, quarantine hospitals are established. This is the only means by which much benefit can be secured through quarantine, but it is seldom employed except against the most virulent type of infectious diseases, such as small pox or cholera.

To accomplish the second, a placard is posted upon a house, stating that a certain specified infectious disease exists in the house, and that all persons excepting physicians and clergymen are prohibited from going in or out of the house under penalty of the law. This system, although defective, is the one generally employed when dealing with scarlet fever, diphtheria, and measles.

Quarantine is intended for the benefit of those who are well, but who are susceptible to infection. In employing the house quarantine method, however, an error is committed in the very act, for in all probability healthy individuals subject to infection will be shut up with the infected, thus augmenting the dangers of exposure. In the houses of the poor, where the sick and the well are often compelled to live in the same room, and even to sleep in the same bed, the risk is especially great. House quarantine often increases the danger of spreading disease, for those who are well but subject to infection, dreading the hardship of confinement with the sick, often leave the house before the quarantine is fully established and find temporary homes elsewhere. If such persons, after their removal, are taken ill with the disease, they establish new centres of infection.

In most cases of house quarantine, it is impossible to prevent uninfected inmates from going to and from their home to their place of business, traveling often in public conveyances. They are thus in danger of carrying, as well as of receiving, infection. It is in this point that the first system of quarantine is superior to the second. By removing the infected person, it protects the other residents of the house, and, through them, the public, from danger. This is especially true of those diseases that are easily communicable by a second to a third party.

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[1] Read at the Buffalo meeting of the A. P. H. A.

So much for kinds of quarantine. We now come to discuss the necessity of quarantine in various diseases.

It is well to enforce strict quarantine against scarlet fever, for at the outset of the disease the danger from the contagium is slight. If a true diagnosis is made early and a thorough isolation is established and maintained, there is a strong probability of the infection going no further. Another reason for enforcing quarantine against scarlet fever is the fact that the disease, while not absolutely limited to childhood, is not common in adult life. Still further, the mortality from scarlet fever is, as a rule, rather high, and we are under obligations to use any means, however inadequate, that will tend to prevent loss of life.

It is our duty to enforce quarantine against diphtheria, because of its virulence, if for no other reason. Fortunately, with this disease, as with scarlet fever, an early diagnosis is possible, and the danger of spreading the infection to others can be removed by the thorough isolation of the patient. Diphtheria is not confined to childhood. One attack does not confer immunity against another, and yet the high mortality attending this disease demands the most careful precautions against infection.

With measles, on the other hand, the conditions are quite different; the first method of quarantine is not called for, and the second is a complete failure. During the prodromal stage of this disease, the dangers from infection are quite pronounced, therefore the patient has often thoroughly exposed a great number of people in school and other public places before the character of the disease has been recognized. To quarantine a person under these conditions is like the proverbial locking of the stable door after the horse has been stolen. Not only is quarantine against measles ineffectual, but it is unnecessary and ill-advised; partly because the mortality from measles is not high, provided the patient receives ordinary care, and partly for another reason, which I shall now proceed to explain.

The adult who has not had measles is quite as susceptible to infection as the child. The man who has escaped the disease during childhood incurs the annoyance of trying to avoid it during the rest of his life. The child can, as a rule, be ill without much inconvenience. It has no business cares; it probably has a home, and friends to care for it. An ordinary attack of measles means to such a child nothing but a short period of bodily discomfort. Not so with the adult. The sacrifice of business interests intensifies the discomfort of every day of illness. Separation from family surroundings—a condition so general with the young business people of our great cities—makes sickness under any circumstances a great inconvenience. When the disease is infectious, this inconvenience is much increased, for under these circumstances the invalid is looked upon as a nuisance, and is often urged to leave the house, at the hazard of his own life and of the health of others. To protect the child from measles, therefore, is an act of very questionable kindness.

Still other objections to house quarantine against measles appear on further study. First, it discommodes the household unnecessarily. There is but little danger of measles being carried to a third party by those going to and from a house where the disease exists; it is unnecessary, therefore, and practically impossible to compel individuals who are in no way liable to infection, or to carry infection, to remain closely quarantined in a placarded house as a means of protection to others.

Second, it excludes children unnecessarily from school, for it is often the rule in towns that practise house quarantine to exclude from school for a specified time *all* children living in an infected house. This is unjust to the children who have already had measles and are in no way liable to spread infection; it is also unjust to children of other families living under the same roof, who are not themselves suspected of disease.

Third, it puts a premium upon the practice of avoiding quarantine by not calling a physician at the outset of the disease, and thus endangers the life of the patient. In their ignorance, the parents or guardians of the patient reason as follows: "This is probably a case of measles; if we call a physician, he will have the house placarded, and we shall be subjected to all of the associated inconveniences of quarantine. If we do not call a physician, we need not be quarantined. Measles is not a dangerous disease. We will call no physician at present, and will thus avoid quarantine. If necessary, we can call for medical aid later." As the result of such action, the patient is neglected; the disease takes an unfavorable turn. The physician is finally called. The patient now has bronchitis, or pneumonia, or tuberculosis, and after a time dies. The family loses a child; not of measles, as the death certificate affirms, but of some other disease, and "an all-wise Providence" is charged up with a death which was really due to the negligence of the parents or guardians. The system of quarantine has killed the patient, and the tables of vital statistics suffer another strain upon their reliability.

The greatest danger from measles is from the effects of the so-called complications, or from sequelæ. Every case of measles should be looked after from the outset by a physician. Daily professional visits may not be necessary, but the laity should understand that measles is a disease not free from danger, and that the responsibility connected with it should rest upon a physician rather than upon the parents or guardians of the patient. Proper advice from a physician at the outset of the disease may prevent the appearance of dangerous complications, or sequelæ. Neglect of such advice may be followed by the death of the patient.

Fourth, it puts a premium upon lying. The family that avoids calling a physician for fear of having the house quarantined knows at the time that the case is one of measles. It overlooks one fact, however, in neglecting to report the case to the health officials, viz.: That the demand on the part of the law requiring the report of an infectious disease applies to householder as well as to physician. The delinquent householder is therefore subject to a fine. If an effort were made to enforce the penalty, the defense would probably claim that the failure to report the case was due to ignorance of the nature of the disease. This is not true, for the fact that the disease *was* recognized as measles was the very reason for not calling a physician. The same set of symptoms, unaccompanied by at least a probable diagnosis of measles, would have sent a messenger post haste after a physician.

Fifth, the quarantine of measles tends to make physicians law breakers. When the law, under penalty, requires that a report of the existence of the disease be sent to the health office, it is not an uncommon thing to find physicians who ignore the law. By this act, physicians not only break the law, but they degrade their profession in the eyes of the public. They also make it more difficult for conscientious physicians to perform their duty in reporting cases.

What should be done, then, by health officials in dealing with measles? Simply placard the house without establishing any system of house quarantine. There are individuals who, on account of already defective health, should avoid exposure to sickness. There are those who do not wish to be ill under any circumstances, and who would naturally, if possible, avoid infection from measles. A placard simply stating the existence of measles in the house would be a sufficient warning to all such persons, while it would be no barrier to the free communication of friends who had no occasion to shun the disease; nor would it deter the sound members of the household from attending to their daily duties away from the home as usual.

Were such a system of placarding followed, a physician would be more frequently called at the outset to cases of suspected measles, and there would be a tendency to lessen the dangers that often attend this disease. This would accomplish more than the rigid quarantine which many of our cities and towns pretend to enforce, while at the same time it would not subject the honesty of householder or physician to too great a strain. It would, in short, be more conducive to honesty on the part of both householder and physician.

SUMMARY OF SANITARY LEGISLATION IN THE STATE OF MEXICO.[1]

By DR. MAXIMILIANO ALVAREZ,

Delegate from that State.

The sanitary legislation of the state, whose history cannot be laid down with precision for the periods that preceded the establishment of the republic, consisted in orders and rulings of momentary necessity, dictated by the governing authorities, with respect to sanitary matters rather than hygienic rules. The state had no sanitary corporation which could be consulted, although it is very certain that the resident physicians of the locality gave their advice, but in a private way and without any official character.

The sanitary corporations that to-day bear a technical responsibility date from a comparatively recent period, and are a collective group which bears the title of Supreme Board of Health of the State of Mexico.

The vigorous action that it has developed is greatly due to the hearty support which that body has received from the intelligent administration of the present governor, Gen. Don José Vicente Villada.

From the year 1892 up to the present date, the members forming the board have undertaken the important work of cataloguing all the sanitary and hygienic rulings, throwing aside those of the first class which have not borne the scientific criterion of the day, and with regard to the second, extending their action until they cover the whole territory of the state.

The philosophy of sanitary legislation in the present day rests on these three bases:

1. Those which attempt to endow the individual with good health.
2. Those which take precautions against disease of all kinds.
3. Those which require the partial sacrifice of individual liberty in favor of the general community.

The food that man uses, proceeding from animal and vegetable kingdom, can be found by him as produced by Nature, and he can apply them to that object, if in the greater part of the cases he is able to ascertain for himself that such articles have not undergone any process that makes them injurious to his system.

The exotic products which are offered to man as preserved by chemical process are very often found to have suffered some alteration through defective manipulation, catalitication, or any other of the many circumstances that would be useless to cite in this paper, and these same products, that dishonest chemical workers try to pass off as genuine, or which are placed in means of preservation, are those which injure health.

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[1] Paper read before the A. P. H. A. in Buffalo, September, 1896.

In order to save man from the diseases that might follow the use of the food products I mention, the committee of food and drink in the board has undertaken important labors in the places for consumption, but which are not of themselves sufficient, however carefully they may be carried out. Here where pork is the chief food, it has been necessary to establish a specially scrupulous inspection of the meat which is sold to the public, and with the help of these police measures the health of the individual is guaranteed.

At the time when the large hog yards were established, on account of the want of sanitary legislation the merchants who traffic in these animals acquired a kind of right to establish their yards even in the centre of the town, thus establishing foci of disease which form the danger to the community, and with the object of avoiding and preventing the diseases which would naturally spread from these foci of diseased germs, as well as to guarantee the healthiness of the food products thus obtained. Regulations have been issued for the management of the hog yards, and for the manufacture of all those other products which are obtained from the hog.

The meat of horned cattle is also used for food, and necessarily has to undergo a proper inspection before the animals are killed, to be afterwards confirmed by a post-mortem inspection. Once the product is declared eatable, it is conveyed under the safeguard of the sanitary police to the places where it is to be sold, which, being considered as places for temporary detention of the meat, are required to fulfil certain requisites of hygiene, that the owners have strictly to comply with. The butcher regulations very clearly lay down the rules that commercial establishments of this class must comply with.

Milk, the food par excellence, the source of life for children and the great treasure for old people, is at the same time the most innocent drink for the sick man and a sovereign remedy for many of his diseases, in virtue of the delicacy of the product, and for these reasons, any defects, whether proceeding from the animal itself, or whether foreign, exercise a material influence on the health of the person who drinks it. In order to take precautions against the diseases that arise from the use of milk, a dairy regulation is rigorously enforced.

DRINKING WATERS.

This matter has, up to the present date, remained under the watchfulness of the public health committee of the city council, which has provided the city with the greater volume of liquid and is now perfecting a contract for the improvement of the piping and distribution of the water throughout the whole city.

The sanitary measures which are taken to prevent certain diseases in man can be considered under two headings: Those which confer a permanent immunity against specific diseases, and those whose tendency is to take precautions against any infection or contagion.

The vaccine lymph which gives immunity *ad vitam* against small pox.

The obligatory vaccination law of the state, which is of a comparatively recent date, lays it down as a fact that vaccine preserves man in a permanent manner from an attack of small pox, in view of the experience acquired and confirmed during many years, as well as the immutable laws of biology. In the explanatory part of the bill, the vaccination committee said as follows:

"Small pox selects its innocent victims especially in the aboriginal race, which through its ignorance does not recognize and even refuses the benefits of vaccine. Any medical observer will have noted that the aboriginal race presents, when attacked by small pox, the most perfect type of the disease that can be developed, and with its most horrible details. The Indian children, whose ancestors for generations back have never been vaccinated, are in the same biological conditions as when the Spanish conquerors imported small pox into the New World, and we know what the disastrous consequences of this importation were."

Medical historians relate that many pestilential diseases, such as the plague of Thucydides, the black plague, etc., in the height of their virulence, carried off so many millions of victims that each one of them in itself threatened to make an end of the human species, but after accompanying mankind through numerous generations, they gradually lost their virulence and finally disappeared altogether. Coming to a more recent case, that of syphilis, which reached its greatest virulence in the fourteenth century, contemporary writers affirm that it has lost much of its gravity, and that it is now gradually being extinguished.

The rational interpretation which can be given to this phenomenon is to be found in the general law of pathology, referring to virus; that the individual who suffers a first attack from a virulent infection, for example, such as syphilis, is afterwards preserved from a second contagion, and by means of an adequate treatment he will be free from morbus manifestations, but he transmits to his descendants, as an inheritance, a natural tendency to the disease, which if not enough to preserve them entirely, is sufficient to attenuate the virulence of the contagion. These circumstances being repeated over and again through innumerable generations, and through the crossing of different races, to which we may add the influence of the different mediums in which they have lived, we may almost entirely admit that syphilis will disappear in course of time, as other virulent diseases have also disappeared.

Will the same thing happen with small pox? Undoubtedly it will, but its disappearance will necessitate the sacrifice of fresh victims by millions, who will each one of them form a case of progressive attenuation of the virus, and it will also require a period of time that cannot possibly be calculated. For the benefit of humanity, we dispose of a means which is at the same time a precaution and attenuation—vaccine. It is preventative through the immunity that it confers on the vaccinated person, and it is an attenuation, because if the subject should unfortunately be attacked by small pox it would be of a mild character and almost invariably come to a happy termination.

The evolution of small pox is, in equality of circumstances, a more serious matter with the child whose parents have not been vaccinated than in those cases when the families have undergone vaccination in three or four of the preceding generations. In recommending the employment of humanized lymph, the vaccination committee discussed which of the three sources of animal vaccine would best serve for the purpose, bearing in mind the circumstances of the race, medium, etc., and it decided in favor of the Jenner lymph. This is the proper place in which to cite the following paragraphs, that are found in a book on the elements of vaccine, written by the person who for some time filled the office of member of the board and chief of the vaccination service in the state.

"The third argument of the defenders of animal vaccine is based on the supposition of the pretended degeneration of the Jenner vaccine, and is supported by what appear to be irrefutable arguments; that if the Jenner vaccine had not lost its strength, the subsequent vaccinations in the same subject would have failed, whilst the fact is that they have succeeded. This argument is not logical, as it deduces a general conclusion from a few special cases. It may happen that two vaccinations practised at different times have taken, one under the form of a vaccinal and the other of a vaccinoid, and it cannot be said that, with a view to defending the venerable Jenner vaccine, an appeal is made to a false hypothesis, but rather that the question is judged from a fair standpoint, and that nobody has said that varioloid and small pox are the same thing.

"The other argument in favor of animal vaccine is based on an affirmation, that the cultivation of the Jenner virus has been attenuated through innumerable generations, and that the day will arrive when it will be nothing but a harmless liquid.

"In the immutable laws of biology, the Jenner vaccine will always take the place that pertains to it, in order to be transfigured in the human species, in its ecstatic and dynamic manifestations, with its permanent character; and if apparently it has been modified, it is not through the attenuation of the virus, but through the soil it is cultivated in. The number of generations of different races that have been submitted to the influence of unknown mediums is incalculable, and through these, vaccine has undergone its evolution, and future generations will feel the influence which is exercised in different manners by the atavism, an important fact that must be borne in mind, and without which our conclusions leave much to be desired.

"For further clearness, let us suppose that A is a generation of vaccinated people; that it produces another generation, A[1], which has been impressed with the vaccinal disease of its progenitors, and is susceptible of fresh vaccination. Another generation, X, receives the virus under the atavic influence of its predecessors, and these circumstances are continued until the day arrives when the individuals are neither properly protected by atavism, nor are they on a soil fertile for the generation of the seed, but to sustain that the virus has degenerated is a very different thing."

On the occasion of a discussion which took place in the academy as to the generation of vaccine virus, Jenner was questioned by Fox, the English minister, and nowhere do we find such a plain and explicit answer as was given in these memorable words: "The grass of the fields has degenerated and so have the petals of the rose."

These ideas are confirmed by the orders which have been published by the government of the republic in the *Diario Oficial*, as follows:

NOTICE TO FOREIGNERS.

Supreme Board of Health, Mexico:

It having been perfectly proved that vaccine in many countries does not protect from small pox, except for a longer or shorter period, which is not the case in Mexico, where experience has shown the action of this preservative to be absolute and final, and desiring the Mexican government that none of the inhabitants of this nation shall be exposed to the disease of small pox, it invites all foreigners who are settled in the republic to be at once revaccinated, or to be vaccinated if they have not already undergone that operation in their own or other country.

E. LICÉAGA,
The President of the Supreme Board of Health.

J. RAMIREZ,
Secretary.

The source of the vaccine being judiciously selected, in order to carry it to the most distant villages and allow all the inhabitants of the state to participate in its benefits, the law provided for the previous instruction of schoolmasters as vaccinating officers. This is the real patriotic part of the question, and that which has admirably decided the problem of the extension of vaccine throughout the territory of the state.

I may be permitted now to copy literally the reasons which animated the vaccination committee in presenting its bill:

"The committee repeats, that in order to comprehend the nature of the aboriginal race, it is necessary to study it in the field of observation, so as to be able to take measures for diminishing the mortality and inducing them to learn and practise the most elementary rules of hygiene. The committee believes that it has found two great resources in the persons of the schoolmaster and physician; the former, because he has naturally to be the most educated person in the village, and is in constant touch with the families of his pupils, who consult him in all their difficulties. For this reason it is natural to suppose that if the schoolmaster has a stock of elementary knowledge of hygiene, he will find numerous occasions to give practical demonstrations. In the special case under study by the vaccination committee, if we demand that the schoolmaster will compliment his pedagogic instruction with the technique of vaccination, and if we impose on him the duty of practising it, the government will be able to count on a fair number of vaccination officers, who, acting simultaneously throughout the state, will suppress one of the causes of mortality, small pox, a disease that is within the power of man and within his duty to eliminate from the table of diseases.

"Still more, if the laws of public education were reformed so that every future aspirant to a professorship could be obliged to pass an examination on elements of hygiene, as well as the theory and practice of vaccination, before the state board of health, without whose approval he could not obtain the desired position, it is very clear that the schoolmaster who is thus trained would be an extremely useful sanitary agent for the state. The hygienic education of the aboriginal race, according to the opinion of the committee, might be undertaken by making the visits of the physician more frequent, even in the most humble and isolated towns of the state, if he were allowed access to the administration with the character of health inspector. Under a special regulation of his office, he would be obliged to be constantly traveling about the state to watch over public hygiene and practise vaccination. Another of his duties would be that of giving oral lectures on public hygiene and vaccination in the schools of the larger towns, and to the professors who would attend for that purpose, and who would be obliged to attend as part of their duties.

"The vaccination committee has not as yet reached a clear idea of the results which undoubtedly would be produced through the connection of the schoolmaster and the physician under these circumstances, and with relation to the aboriginal race, it only points out what might be done and begs a full consideration of the case.

"As the government now maintains 1,010 schoolmasters under the new organization, these might be transformed into an equal number of vaccination officers, and such conversion would not cost a single cent more to the public treasury."

The above data facilitate a synopsis of the humanitarian law of vaccination which has been enacted in the state, and a copy of which I annex to this paper.

As a general rule, the sanitary laws of the state are in accordance with modern science, and it could not well be otherwise, as the new legislation relating to infecto-contagious diseases, whose pathogenic character has only recently been indicated in academic discussions, requires the advice of specialists who have made these their study; and for this reason it is necessary to be very careful with the so-called preventative methods against many diseases, the special serotherapias for every affection.

Without ignoring the results of a careful observation confirmed by experience, the government very prudently abstains from the official employment of the system, although it strongly recommends the study of it to the hospital physicians, and time will show what the real facts are.

As man cannot avoid those diseases in view of our present knowledge, once they obtain a hold on him, and in order to avoid the establishment of foci of distribution and the transmission of the disease to other localities by the patients themselves, by their attendants, or by the objects which they may have used, the regulations provide for the isolation and disinfection of such, as well as for the measures that tend to conjuring the danger.

It is right and proper that the patient should find his relief in the use of medicines, and in order to obtain it, it is an indispensable condition that the drugs should be pure and the technique of manipulation correct. This double object is obtained by the drug-store regulations.

The leprous spots of all the centuries' prostitution—which, to tell the truth, does not reach in this city the stage of a social gangrene that it has attained in others—is tolerated under severe regulations, and is watched over wherever it appears, either in individuals or in communities. Its provisions have a double object,—a moral object, in preventing this evil from corrupting the public in a marked manner and preventing the scandals that are found in other places; and also a hygienic object, which is to prevent the diffusion of syphilis, and other similar diseases, by means of a strict and careful sanitary inspection. A reading of the regulations on the subject will thoroughly explain what has been done.

The energetic organization under which the state is being developed, through the administration of the governor, Gen. D. José Vicente Villada, with the help of the sixteenth legislation, led to the organization of a theoretical and practical school of obstetrics for women, a praiseworthy arrangement that opens the doors of an honest future to woman, and enables the mothers of families to receive the proper and necessary attention they require from persons of their own sex.

As women who could give these services were scarce in the state, the government maintains for each political unit a young woman, who, after terminating her studies, will return to the county seat, and in this manner the public will obtain the disappearance of the ignorant women who appear at the bedside of a woman in labor, and who only fulfil the mission of Atropos, and incessantly cut the thread of life of both mothers and children.

This law can be considered as complementary to that on vaccination, because it is first necessary to preserve, in order to afterwards perpetuate, and from the point of view of the vital forces of the state, the death of a child is more serious than the loss of the mother of the family.

The biological synthesis of the animal species is to increase first and multiply afterwards.

Gentlemen, I have the pleasure of again greeting those who with a humanitarian object here met to combine their intelligence and to unite in the worship of Hygeia, and from whom the nineteenth century expects great results in the improvement of the conditions and under which the human race can develop, and from whose discussions science will derive elements and data for the preservation and prolongation of life.

MORTALITY OF CHILDREN—ITS CAUSES AND MEANS OF DIMINISHING IT.[1]

By SALVADOR GARÚADIEGO, M. D.,

Professor of Medical Clinics and Director of Medical School of Guadalajara, Delegate from the State of Jalisco.

Three are the causes of childhood's mortality,—crime, carelessness, and ignorance.

Society is so severe and so ungrateful in judging women's conduct,—who never forsake their faults, whatever the circumstances may be in which they were placed at that time,—whenever a woman has forgotten her duties for the first time, she is compelled to conceal her real situation and even attempt to end her offspring's existence, or to abandon it, minding not its future.

The habit of looking for wet nurses to substitute mother's food has caused the death of many children when they belong to the low ranks of society, because their mothers are compelled to deliver them into mercenary hands in order to be able to undertake the care of children of the higher classes who enjoy wealth; or, on the other hand, when they send them to the country to be nursed by peasant women together with their own. This awful habit, besides occasioning the death of many children, hardens the maternal feelings, obliging them to lay aside the sacred duty of bringing them forth in life. These poor women are in the necessity of abandoning their homes, and, therefore, all their dearest attachments. They consent to be substituted by strange hands while they are occupied in attending to the children of better-off families, with the result that the new-comers obtain their husbands' affections, the servant becoming the lady. When unmarried women are preferred for this purpose, prostitution is increased, because this kind of people care not for their children; they deliver them into friendly hands, or to some relative, and at last the poor creatures perish. And as an increase in the number of the family is looked upon by them as a misfortune, the little one's departure from this world causes not a single tear from the parents—they may even rejoice at the result.

Women belonging to the low ranks of society pay little or no attention to the welfare of their families, and care not for their feeding, clothing, and moral education. And especially the improper alimentation causes great ravages among the little ones raised under the worst hygienic conditions that could be imagined, and consequently exposing them to all kinds of infectious diseases.

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[1] Read before the American Public Health Association, assembled at Buffalo, September, 1896.

All these causes combined is the most powerful reason of the great mortality of children in the world.

People's ignorance, and generally their bad habits, produce the worst results in the breeding of their children, not giving the proper attention to their diseases, or attending them when all hope is gone. On the other hand, they very often comply with every whim of the child, incurring thereby the chances of disease, and by the rashful administration of dangerous and powerful medicines endanger their lives. All these conditions, added to the morbid susceptibility of children, increase the mortality of children to such a tremendous number that it causes astonishment to realize it, and any experienced practitioner can see it in his medical life.

Before showing the means which, according to my judgment, might diminish the mortality of infants, so disastrous to the country, I must consider those conditions which directly affect our social customs. Having in view the vices which abound in modern society, we ought to select the means to correct them, or at least try to diminish them and counteract their consequences. Taking into account the purpose entered upon, we should lend them a charitable hand and give protection, instead of throwing them the cold laugh of scorn and derision. We can undoubtedly correct to a certain extent the vices of society by illustrating and moralizing to the people, and not by reminding them of their misery and lowness. If the bad deeds must be punished, the good ones deserve a reward in order to stimulate mankind into generous actions.

Under this consideration, I have the honor to present to the deliberation of this illustrious association the following conclusions, which I think very reasonable, as diminishing mortality among the children, to improve the condition of the people, to increase the number, and, above all, to correct the grave faults I have already pointed out and which are, unluckily, so common in the world:

1. By the institution of lying-in hospitals, or obstetrical departments, by which means it has been proved that infanticide nearly disappears.

2. By establishing orphanages and homes for foundlings under the care of the government, and also under the protection of the public beneficiary, and under the care of religious people and especially the parishes. In each of these asylums a limited number of children should be allowed, in order to be properly cared for and attended to.

3. For the feeding of infants in these institutions, the mother's milk should be replaced by that of the she-goat, or other nearly as proper as the former, using the utmost care in the cleaning of bottles. The milk should be given to the child by means of a little sponge applied to the mouth of a bottle, and as fresh as can possibly be obtained,—just as it is coming out from the cow or the she-goat. This way of feeding infants must be followed in all cases in which the mother is unable to bear her offspring, and by no means should be allowed the further use of wet

nurses. An exception to this rule must be allowed in unusual circumstances.

4. Mothers who abandon their children should be severely punished, and also those who neglect to give them proper care, and, on account of their occupations, leave the little creatures exposed to disease and misery.

5. A premium must be awarded to all those who have brought up and saved a certain number of their children, and also to the parents who, in spite of their poverty, have succeeded in raising their little ones.

In order to reach the said purposes, the government must provide the institutions and give protection, and the whole society must call forth the charitable sentiment of the people in general. The government and society will appoint a prize to all those who well deserve it through the carrying out of the deserved object.

Asylums should be established for women whose first faults have driven them to prostitution, where they will be given religious and moral instruction, in order to induce them to good habits.

VENTILATION.—THE NECESSITY OF ISOLATING THE BEDS IN HOSPITALS BY MEANS OF WINDOWS PLACED BETWEEN THE BEDS.

By J. E. MONJARÁS, M. D.,
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In order to preserve his health in an absolutely perfect state, man must breathe, and breathing cannot properly accomplish or fulfil the part that physiology has assigned to it in all the functions of life, unless it lets into all the tissues the gases which are necessary in quality as well as in quantity.

The least disorder in any of these conditions endangers health or life. Now the air in cities is very seldom pure like that of the country, the mountains, or the seaside; thousands of causes may contribute to vitiate it, and these are greater when concentrated in rooms. Hygiene takes great pains to let the air into them, if not entirely pure, because this is impossible in cities, at least to let in the air which circulates in the streets and affords the means to keep it in the interior in the same composition or in a degreee compatible with health. It shows the causes which can contribute to the contamination of the air either in the exterior or in the interior of rooms; it points out the composition of the vitiated air, its effects upon the human organism, and the means and processes or methods to which the hygienists can recur in order to avoid the action of vitiated air upon the inhabitants of a place, and to keep unimpaired the function which hygiene has assigned to it.

The causes which may contaminate the air of inhabited places are the following:

The close proximity to unhealthy industries, deposits of organic matters, garbage, sewage, cesspools, neglected yards or yards which are occupied with matters in a state of decomposition, close proximity to poorly-constructed sewers or sewers which do not operate well; deposits of fecal matters which serve as water-closets situated near to or in the house; close proximity to stables, the emanations from the ground where a house has been built and where proper care has not been taken to isolate the same; the escape of illuminating gas through imperfectly-laid or broken mains; the constructing materials when containing organic liquids in a state of decomposition or which have been saturated by them.

Man himself constitutes one of the most powerful elements in the contamination of the atmosphere of his own abode; the products of his breathing poison it, the gases, vapors of water, etc., intestinal gases, perspiration, the parasites and parts of the skin itself when taken off, some specific micro-organisms when the dweller suffers or is troubled with any disease which may be transmitted through the air; the blood or pus from wounds not entirely healed; expectoration; the large or small animals which sometimes live with man intentionally or accidentally, such as insects, rats, etc., etc.; the articles and substances which he uses for his food, comfort, or toilet, the cigars, etc.; the impurities adhered to his clothes or shoes, the particles, the fibres which constantly come off from goods, from furniture or from carpets, which, being crushed and reduced to powder by the feet, mingle with the air of the room by means of the wind; and the products of heaters in the room.

The greater the number of dwellers or visitors in a given place becomes, the more liable to decomposition the air of such place will be.

When the occupants of a room remain in it for several successive hours, days, weeks, and months, the air therein loses all the conditions favorable to breathing unless fresh air is admitted.

When those who dwell in a room suffer from some disease and cannot bathe themselves well, the decomposition of the air is greater.

Now this is precisely what occurs in a hospital, and for this reason it is necessary to employ in such places with the greatest care not only the means of ventilation, but also other resources which would bring about the destruction of such bodies, which, when they come off from the skin, the clothes, or secreted liquids, are converted into so many germs which seek a lung where they can implant themselves in order to again develop themselves, thus becoming a menace of death or of sickness to the ignorant or imprudent person who, being desirous of getting some fresh air, opens widely his respiratory organs and receives them.

It is very difficult to determine accurately the composition of an air so vitiated. All the causes we have just enumerated throw into it its impurities and form a mixture the analysis of which it is unnecessary to effect in order to know that such air is already vitiated and not fit to breathe or live in. The mere smell of it will convince us that it is impure, since the proportion of carbonic acid indicates the degree of decomposition, it having been observed that when the quantity of C o = 2 exceeds 0, 6 per cent., the quantity of other matters has reached the limit compatible with health.

When there is habitually in a room an excess of water, the elimination of the aqueous vapor through the pulmonic and cutaneous channels becomes difficult, and we might say impossible, if the air has already become saturated. The functions of the kidneys are affected, and nephritis with all its consequences becomes imminent.

Besides, the organic matters that should be timely and regularly expelled with the vapor which acts as a true vehicle for them, are kept in the inner organism, while the water is eliminated by the only outlet left to it, namely, the kidneys, and molecules that may be decomposed, which should be promptly eliminated, are retained, being sometimes the cause of a veritable deadly auto-infection. Although it is a fact that these substances have been successfully eliminated, yet it is none the less true that the air in the rooms has not been changed, and they float in the atmosphere, where they encourage the putrefaction and development of the germs, which are absorbed with the air breathed, evolve more or less easily some infection, as, for instance, typhus, which finds there a fit ground for development; or when these organic bodies are directly derived from a diseased focus, they can produce immediate infection if they have already a specific character, as it happens in scarlet fever.

In order to prevent the air from acquiring this composition, which is so injurious, or to purify the same when it has not been possible to avoid its alteration, the rooms should be furnished with a cube of air in proportion to the number of persons dwelling therein. A good system of ventilation and a careful and daily cleanliness of body, as well as of the furniture and other objects contained therein, and of the inner surfaces, will complete the hygienic conditions sought after. These three conditions should be simultaneously employed, never pretending to substitute one for the other, as each one of them has its special object.

The majority of learned men who have undertaken the solution of this problem have been specially concerned with determining the amount of carbonic acid which may vitiate the air of a room, without taking into account, or only partially considering, the impurities derived from the cutaneous, pulmonary, and intestinal secretions; from the dust and bodies that the clothes and shoes worn during the day may transmit to the air, which in spite of these remarkably injurious properties, retains the same acceptable amount of carbonic acid from a hygienic point of view.

Once we have succeeded in perceiving, through our senses, the presence of carbonic acid in a given place, for instance, a theatre, church, etc., etc., the respirable air, which according to hygienic principles must be pure, will then contain an enormous quantity of germs, organic bodies in a state of decay, deleterious gases, which will tend to provoke a peculiar susceptibility on the part of the visitors to contract this or that infectious disease, and will even engender the same.

If the cube of air allowed to each individual is efficient and not fictitious, we must allot 35 c. m. of space to each person, and, above all, regulate the ventilation so that the whole air may be readily renewed three times every hour, an operation which, without producing strong drafts, will enable us to furnish pure air to the lungs.

So much concerning ventilation. Now, as to the natural disinfection of the atmosphere, it becomes necessary to control large and powerful currents of air which may, so to speak, instantaneously sweep out the atmosphere of the room.

What has been said about private dwellings is also applicable, in a larger and more humanitarian sense, to crowded rooms, especially when they are occupied by patients, who, by reason of their illness, cannot easily be kept clean, and from whose bodies issue decayed products and pathogeneous organisms which find in this vitiated air an element favorable to their development.

It should also be borne in mind that when it is deemed necessary to increase the cube of air in a room, it will not be sufficient to raise its walls, but it must be done at the expense of the breadth or length of said cube.

The warm and vitiated air issuing from the lungs is, doubtless, not dense enough to readily ascend to the upper part of the room, but it soon gets cold, and nothing can prevent the carbonic acid and the solid molecules from precipitating in the lower *strata*, when the upward movement which carries them away ceases.

Besides, it is well known that the warm air mechanically carries up the carbonic acid and the bodies floating therein, just as is done through a chimney tube; so that when the temperature ceases to act, the gases are spread downward and bathe, so to speak, the respiratory organs of the occupants.

To those who increase the cube of a room sacrificing its height, without allowing a convenient limit to this factor, Prof. Corfield of London has this to say: "Beyond a certain elevation (three metres) the respirable atmosphere is of no use whatever."

To cite an extreme case as an example, we will observe that a man, placed upon a square metre of ground, surrounded by walls a thousand feet high would, in a short time, be asphyxiated; and yet he would be there in an atmosphere of 1,000 cubic metres of air. Without assigning a limit to the outline or the height, we can more readily realize what aglomeration means. For instance, the whole population of the globe would die of asphixia if it should be concentrated on the Isle of Wight, which, however, is sufficiently extensive to contain the same.

We must, therefore, not exaggerate the height of the ceiling with a view to increase the cube of the room, because this, as stated above, is practically a fallacy.

There is no objection, from an æsthetic point of view, to allotting in some hospital from six to seven metres of height to the patient's ward and the same might even be done in private rooms, but the conscientious hygienist should, in making his estimate of the cubage, only allow four metres as the maximum of height of the ceiling and to disregard everything beyond this amount, even though for æsthetic reasons he may be obliged to raise the ceilings to seven metres. The minimum height that should be allowed is three metres, and in both cases the windows should reach this height.

After knowing how limited is the power of the cube of a room to keep pure the air therein, we should proceed to determine the power of ventilation which so effectually assists the same.

We may say that the object of ventilation is to cause the outer air to be drawn into a room and to expel the same therefrom outwardly, the result obtained being to dilute, by means of fresh air admitted, the gases resulting from the alteration of the atmosphere of the room, imperceptible ventilation, or to sweep, so to speak, the air of the room, throwing it out and substituting it in a short time with air from without, viz., tumultuous ventilation, or the sweeping of the air by the air itself.

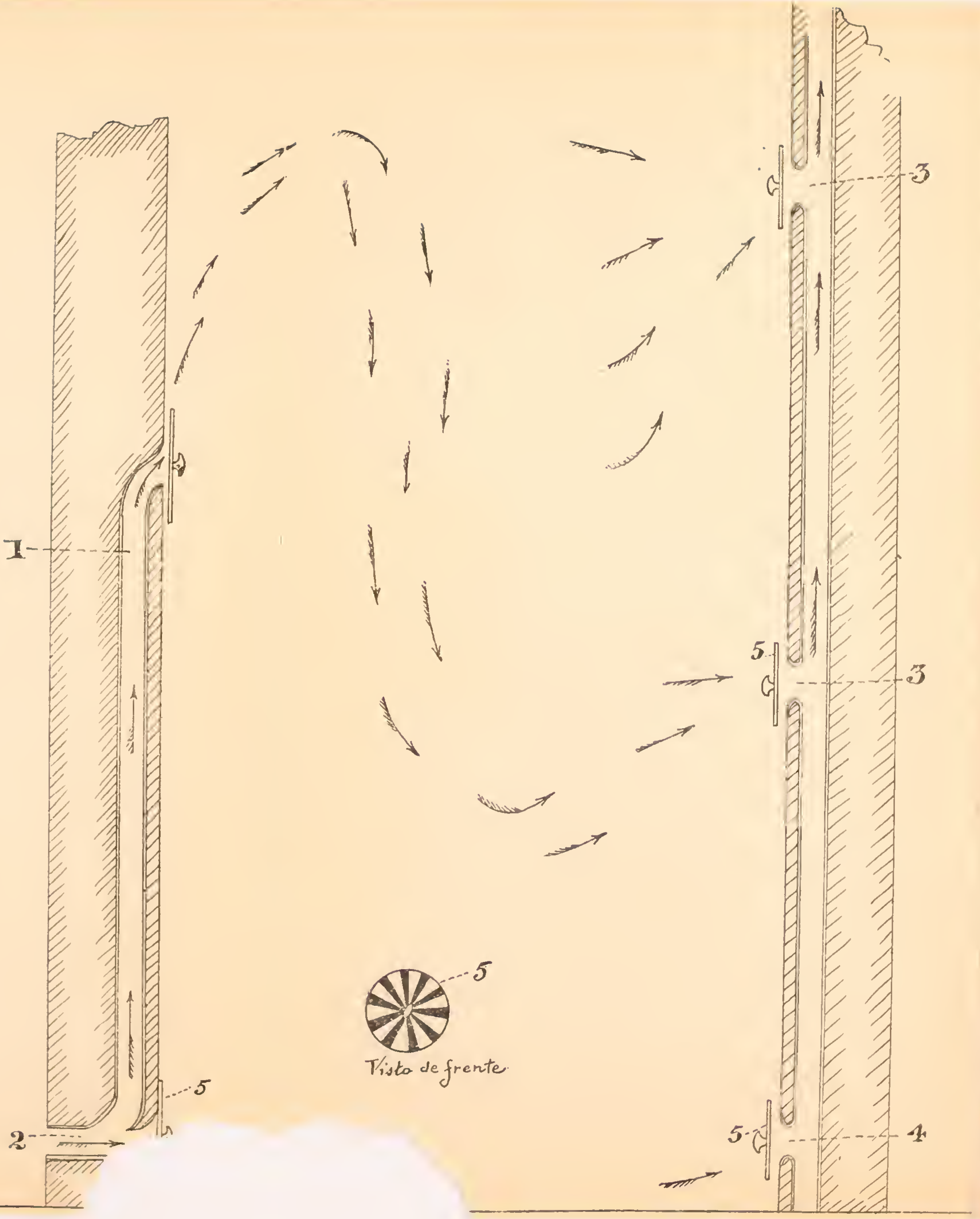
The effects of the first ventilation should not be felt by the dwellers and it is chiefly employed while the room is occupied by them.

The second ventilation is used only when the room is empty or when the difference of temperature between the inner and outer air is insignificant.

Each of the ventilations, the insensible as well as the tumultuous, is carried out by a different technical process; for the first, orifices of a certain form and diameter are employed, and they should be placed diametrically opposite in a diagonal line.

The tumultuous ventilation requires the employment of windows or doors and it is more efficient when they are situated in points diametrically opposed to each other. The technical process for the first varies according to the climate; where the difference of temperature between the inner and outer air is almost insignificant, orifices which can be formed in the same windows may suffice, but when this difference is very great, then it is preferable to form these orifices in the walls and connect them with tubes which are arranged in said walls nearer the interior than the exterior, so that, in passing through them, the air may be heated with the heat in the room so as to prevent its being cold when it reaches the occupants of the room. The direction of the current should be upwards, being opened in the interior by an orifice of from ten to fifteen centimetres in diameter (never beyond thirty centimetres) and in a funnel shape, the wide portion of which should be directed inwardly. The walls of this tube should be polished in order to avoid the friction of the air.

The orifices serve both to introduce fresh air in the room and to remove the vitiated air therefrom. There is a close relation between these two effects; the more the vitiated or hot air is expelled, lesser will be the pressure of the atmosphere of the room, and larger will be the amount of fresh cold air introduced therein. The difference of temperature between the cool air from outside and the hot air within increases the renewal of air in the room to such an extent as to be uncomfortable. It is, therefore, necessary to regulate these orifices so that the air that is introduced in the room may not cause any discomfort, and may even pass unnoticed by the dwellers. For this purpose, it should be taken into consideration, in accordance with what has been above stated, whether the air that is to be introduced is very cold or not. In the first case, it is necessary that the inlet orifices be formed at the level of the floor outside, connecting with pipes or tubes two metres long and, at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least, fifteen centimetres in diameter, placed in the inner half of the wall and ending within the room. (See Fig. 1). The air which has passed through these pipes, in mixing with that of the room, first ascends to the ceiling and then insensibly descends to the floor by successive strata.

It is well to remark, in general terms, that these orifices should be increased in number and not in size whenever a proper ventilation may demand a larger admittance of air.

It may be estimated that a tube of the said diameter may admit 90 c. m. per hour, when the difference of temperature between the inner and outer air is 13°.

When this difference is slight and insignificant, these orifices may be formed in the wall directly from the outside towards the inside (Fig. 2) and the level of the floor, always giving them the size indicated.

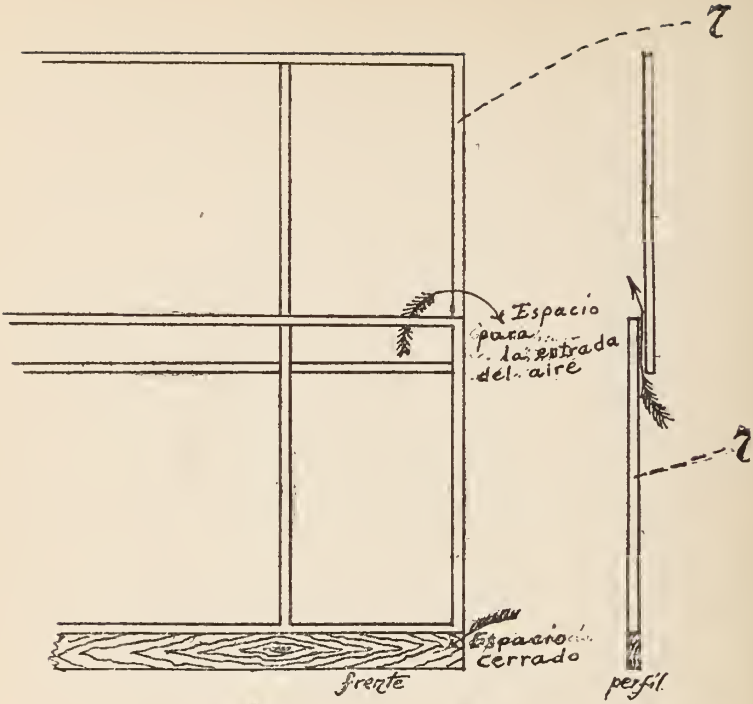
But, under such circumstances, it is more advisable and also more efficient to regulate ventilation by means of windows.

The orifices which are used to expel the vitiated air should be formed opposite to those first mentioned (Fig. 3), some of them at 2½ metres above the level of the floor, and others at the level of the ceiling. The upper ones should be used in winter only, when the difference of temperatures between the outer and the inner air is not very great, and, in summer, both should be used. When the light draught stoves, known as "economical stoves," are used to heat the rooms, the least warm air, which is found below, near the floor, should be expelled and not the air heating these stoves, which is found above, at a height of two metres, and near the ceiling. Then the outlets should be formed at the level of the floor (Fig. 2), communicating with the tube that passes through the interior of the wall, closing No. 3 and 4 by means of a simple mechanism, valve or diagram (Fig. 5). All the outlets may be kept open in summer.

In all cases these pipes preferably end on the ceiling and are provided with caps which prevent the air from returning to the room, and whenever the heat is excessive they should be provided with mechanical ventilators, which are well known by everybody in the trade, among which Page's burner occupies a high position, because, besides drawing out the air from within in any desired quantity, it fulfils another very important function, namely, to destroy by means of a temperature of 200°, the injurious gases which may pass through it and to thoroughly deodorize a room in a very short time. This ventilator is especially employed for ventilating water-closets (Fig. 6).

The mechanical ventilators of Banner, Lavallois, Werver, the hydraulic ones and the American fans moved by electricity, which may be employed to cool a room and to draw out and introduce air at will, may also be employed.

As for the inlet air tubes, they may be forced during the hot season, through cold or iced water boxes, which, while checking the circulating dust, cool the air which enters the room.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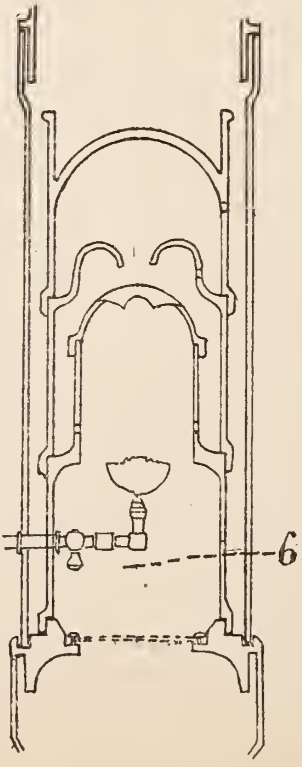
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These openings are not sufficient to produce the tumultuous ventilation, and it is necessary to employ larger orifices, windows being suitable for this purpose, as it is through them that the most important ventilation is produced. When windows are open, it is very difficult to determine the quantity of air that passes through a room in a given time.

This quantity of air is out of all proportion as regards the quantity which is secured by means of the most powerful ventilators. Let us suppose, for instance, that a current of air comes from a single window and travels at the rate of 10 miles per minute. Such current will scarcely be noticed and, at most, it will slightly bend the flame of an interposed candle. If this current is produced by two opposite and completely open windows having 1 m 5. in width by 3 m in height, the volume or cube of air which said current introduces per minute in the hall is equal to 1 m x 3 x 10 = 45.

In one hour it will be equal to 5 x 3 x 10=45 x 60 =2,700 c. m. and six open windows will give 16,200 c. m. per hour. It is a veritable sweeping out in large currents of the whole atmosphere of a hall, leaving far behind the results obtained by means of the ventilators (Ch. Sarasin, Dictionary of Medicine and Practical Surgery, XVII, p. 728).

This ventilation can only be utilized during the absence of the occupants, when the currents of air blow upon one of the windows or when the inner temperature is very high compared with the outside temperature. Under these circumstances, its effects are unfavorable and even injurious. Otherwise, and especially when the difference between the inner temperature and the outside temperature is insignificant, the contrary happens, and the effect is very pleasant.

The regular or periodical opening of the windows at given hours constitutes the most simple process of ventilation, being at the same time, the most economical and efficient, when the room is swept and thoroughly cleansed. This opening completes the cleansing process without which it would be imperfect, as can be seen when we enter the rooms or halls of hospitals, the windows of which have been closed in those moments or during some hours. Objection can be made to ventilation because windows tend to chill the air of the room in winter and especially so in those countries where the cold is intense, but this can be avoided by providing double windows, as they do in the Victoria hospital in Montreal, Canada.

In order that ventilation by means of windows may be completely efficient, they must be placed opposite to one another and must extend downwards to about the level of the floor of the room and upwards nearly to the ceiling. The total of their surface should not exceed one fifth ($\frac{1}{5}$) of the total surface of the room or hall of the hospital; the distribution of said windows in the latter place should be such as to provide one window between each patient's bed, as this will not only render the ventilation very efficient under all circumstances, but the rays of natural light that come through them (the hygienic property and power of which all learned men recognize) will naturally isolate one patient from another and will opportunely disinfect the vitiated air in the perimeter of each patient.

There are several systems of windows, one of them being that which admits of the panes being opened in two directions, the sash rotating around two vertical shafts. This system can only be applied successfully in warm climates where the difference of the exterior and interior temperatures is almost insignificant, but in very cold climates the air that enters through said window affects directly the occupants, causing them to experience a very disagreeable sensation. This is also the case with the system in which the panes are divided in several sashes which rotate on horizontal shafts. The best system is that known as the Guillotine system (Fig. 7), in which, by means of a simple mechanism, the air may be admitted to any desired height, preferably giving to the current an upward direction from without to within. Thus the occupants receive the fresh air already distributed in the upper strata of the air of the room, and the air does not produce upon them the effect of a cold douche, as is the case with other systems. In all systems the operculi may be placed in the upper part which, by means of a metal rod, may give to it the desired inclination. This arrangement affords the greatest advantages especially when perforated glasses are employed which, without diminishing the light or lessening its natural resistance, is provided with 5,000 conical orifices to each square metre, and the small base of which is of 3 m. m. and the large one of 6 m. m. of diameter, whereby a surface of 0.035 to each square metre or 3.5 per 100 of the total surface of the glass is obtained. Its employment will be found suitable for the windows of the rooms where there are water-closets, and wherever a permanent ventilation is required.

It is also advisable to use said glasses in occupied rooms, but only in the upper operculum of the window, and since the employment of them even in this way may cause discomfort at times in consequence of the air which can pass through them, it is preferable to cover them by means of a rotary frame which may change them at will.

In climates where the cold is intense, heating surfaces should be arranged around the windows, in order to heat the cold air that may penetrate the rooms and to counteract the anti-thermic action of the same.

We again insist in recommending the arrangement of a window between the beds in hospital wards which may open almost the whole length of the wall, it being preferable to obtain in the whole number of windows 1-5 of the total interior surface. By this arrangement the particular atmosphere of each patient can be readily disinfected, and thus natural isolation is secured. If we agree upon these two principles, viz.: that each patient constitutes a focus of infection which propagates itself in a radium more or less extensive, according to the nature of the disease with which the patient is afflicted; that the action of the sun, as that of the white light and the air constitute the best natural disinfectants, we must also admit that to isolate one bed from another by means of narrow windows (the total surface of which should not exceed 1-5 of the total interior surface) is an application of great practical value which, besides facilitating considerably the technical process of ventilation, produces an æsthetic and pleasing effect in hospital construction.

But the effects of ventilation, even of the tumultuous kind, never succeed in completely throwing off all the solid particles deposited either on the furniture or the walls of a room. And inasmuch as these solid particles are mostly composed of germs or organic matter capable of contaminating or poisoning, by means of the volatile ptomaines of the atmosphere containing them, it follows that however powerful the ventilation may be, they are powerless to destroy these causes, which are even more injurious than the pestilential gases. These bodies, even when the best means of ventilation are employed, are never completely expelled from the room containing them. It is necessary to destroy them on the spot, and by means that will not harm the dwellers, or that will not, at least, prevent them from using the rooms. It is also necessary to destroy them as they come off, and in order to do so the most powerful and best-arranged ventilation is not sufficient. Such ventilation may expel from the room the lighter bodies floating in the atmosphere, but it will never expel the heavier and more dangerous ones which closely adhere to the bodies, the clothes, the shoes, the hangings, the furniture, the floors, walls, and ceilings.

It is therefore necessary to recur to an efficient means, besides ventilation, to destroy these germs or particles of organic matter, as they are produced by the occupants of a room, since such germs or particles are capable of contaminating and infecting. This means consists in frequently washing the bodies, as well as the walls, floors, and ceilings of the rooms. Ventilation would be useless without this essential requisite.

Ventilation may be easily aided by merely scrubbing the surfaces of the room with a mop, and it may be rendered thoroughly efficacious by carefully washing the body of the patient and also washing the room. Without this powerful aid, the best ventilation will always be deficient. The impurities in the air of an occupied room are the result of the impurities accumulated by the objects contained therein,—mattresses, quilts, curtains, clothes, shoes, etc., etc.

Experience shows that of two rooms, one occupied by a number of clean persons using clean clothes, and the other by the same number of filthy and ragged persons, during the same period of time, the former will only require a comparatively slow ventilation in order to obtain, if not an absolutely pure atmosphere, at least a healthy one, whereas, in the other room, the most powerful would not be *sufficient to destroy even the bad odors.*

The following deductions may be drawn from the above:

1. That in order to preserve life's integrity, it is necessary to introduce

pure air into the system, allotting a cube of air of 35 m. to each person dwelling in a room.

2. That in large cities it is difficult or impossible to obtain pure air in the true sense of the word, however excellent the system of sanitation may be in such cities; but that the air circulating in the streets may be and is really sufficient to meet our needs when it has not been contaminated by unhealthy *foci*, or industrial establishments, such as swamps, tanneries, etc.

3. That these sources of infection should by all means be excluded from the vicinity of dwellings, and that such air, as well as that issuing from yards and barns, should not be allowed to enter the rooms.

4. That the air which enters the rooms is immediately vitiated by the organic particles previously deposited on the inner surfaces of the walls, floors, ceilings, and different articles, and by the emanations and secretions of the dwellers.

5. That these emanations may be gaseous, liquid, and solid.

6. That the gaseous ones, to which a predominating *rôle* had hitherto been assigned in the vitiation of the air, really perform a very limited function in such process of vitiation, compared with the liquid ones (for instance, perspiration), and especially with the solid emanations, putrifiable organic remains, and germs.

7. That when the rooms are occupied by persons suffering from contagious diseases, the air may be the main vehicle for the transmission of such diseases to one or more persons, according to the nature of the disease, as for instance, influenza, scarlet fever, small pox, diphtheria, etc.

8. That the air thus vitiated acquires a composition which is difficult to define, but experience shows that a knowledge of the proportion of carbonic acid is sufficient to estimate its decomposition.

9. That the CO_2 is selected as the test, not because it is the injurious element in the vitiated air, but because there is a close relation between the amount of the same and that of other substances which adulterate the air, just as in water there is a close connection between the nitrates and its richness in micro-organisms.

10. That when the amount of carbonic acid reaches tc 0.67000, it is essential to renew this air, which, under such circumstances, is deemed incompatible with health, suppressing at the same time the organic bodies which are deposited on the inner surfaces of the rooms and upon the objects contained therein.

11. That in order to obtain the former, ventilation might be successfully employed, but to secure the latter it is completely inefficient, while the antiseptic washing of the surfaces produces a better result because of its efficient action, and therefore it should not be substituted even by the most perfect ventilation.

12. That this washing should be effected every twenty-four hours and before the decomposition of the organic matter and micro-organisms sets

in, and to this end the inner surfaces should be polished and made waterproof, and the angles should be rounded.

13. That in order to ventilate a room, a wardrobe of a hospital ward, waiting-rooms in theatres, etc., etc., it is necessary to employ two kinds of ventilation: the small permanent or insensible one and the large intermittent, tumultuous one, viz.: the sweeping of air by the air itself.

14. That in order to obtain the former ventilation, it is necessary to form conical orifices and smooth tubes from 15 to 20 c. m. in diameter, ending 3 metres from the interior floor and whereby the air of the room may be completely changed three times per hour, and they should be inserted in the inner half of the walls so that the temperature of the air that comes in may be somewhat moderated.

15. That the vitiated air which should be drawn off in a slightly larger volume in order to diminish the interior pressure before the fresh air enters, should also be expelled through outlets and inserted tubes like those previously mentioned, but placed at three different levels, according to the difference between the inner and outer temperature, and in accordance with the system of heating rooms, as follows: one at the level of the floor when the heating is effected by means of economical stoves of small draught; another placed at half the height of the walls in order to give immediate exit to the vitiated air which is near our respiratory organs and which, owing to the fact of its not having been condensed, cannot advance so as to pass out through the upper orifices. And finally, that when the heating is effected by steam, it is preferable to use the orifices of the upper part which are nearer the ceiling, in order to facilitate the exit of the less dense air.

16. That the tumultuous ventilation should be effected through windows arranged opposite to each other, whereby a current of air is admitted which will be sufficient to renew in an instant the whole air of the room.

17. That it being an established truth that patients may contaminate the air which surrounds them in a perimeter more or less large, according to the nature of the disease with which they may be troubled, and that the sun, the white light, and the air exercise the greatest disinfecting power known to men of science, it becomes an urgent necessity to introduce in hospital construction the system of isolating one bed from another by means of windows, the total surface of which should be that approved by hygiene from a thermal point of view, that is to say, 1-5 of the total surface of the room, said windows preferably extending from the floor to a point near the ceiling, whereby ventilation is greatly facilitated and a most pleasing æsthetic effect is produced.

REPORT OF THE COMMITTEE ON THE TRANSPORTATION OF DISEASED TISSUES BY MAIL.

At the meeting of this Association held in Denver, Colorado, October 4–7, 1895, the following resolution was adopted:

WHEREAS, An order of the Postmaster-General prohibits the use of the mails for the transportation of diseased tissues;

WHEREAS, Specimens suitable for bacteriological examination can, when enclosed in proper packages, be transported in the mails without endangering the health of persons who may handle them, and without risk of contaminating other mail matter, and

WHEREAS, Bacteriological examinations in cases of tuberculosis and certain other infectious diseases constitute an invaluable defense against the spread of pestilential affections, by providing an exact method for early and accurate diagnosis, therefore, be it

Resolved, That the American Public Health Association hereby respectfully requests the Postmaster Generals of the United States, Canada, and Mexico to so modify the orders now in force that specimens of diseased tissues, when properly enclosed in approved mailing packages, may be admitted to the mails for transmission to state and municipal laboratories.

The following committee was appointed to carry out the purpose expressed in the foregoing resolution:

Dr. E. P. Lachapelle, Canada.
Dr. Henry Mitchell, United States.
Dr. Domingo Orvañanos, Mexico.

Acting as a member of this committee for the United States, the following letter and accompanying documents were sent by the undersigned to nine of the most prominent bacteriologists of this country:

ASBURY PARK, N. J., December 21, 1895.

DEAR SIR:—At the meeting of the American Public Health Association held in Denver, Col., October 4–7, 1895, the enclosed resolution was adopted, and the undersigned was appointed to represent the Association in bringing this subject to the attention of the Postmaster-General of the United States.

Please see the accompanying memorandum, and also circular 85 of the New Jersey State Board of Health (page 635).

A sample mailing package is also sent.

Will you have the kindness to forward to me, for use in presenting the subject to the postal authorities, an expression of your judgment concerning the safety of sending specimens for bacteriological examination by mail?

Very truly yours,
HENRY MITCHELL,
Member of Committee.

OFFICE OF THE STATE BOARD OF HEALTH,
TRENTON, N. J., October 1, 1895.

MEMORANDUM.

After experimental construction of receptacles suitable for conveying specimens of diseased tissues through the mails, the one here described has been selected by this Board as being appropriate for this purpose. This package consists of,

(I) A strong glass bottle having a capacity of three drams. The bottle is provided with a metal screw-cap, made water-tight by means of a rubber washer.

(II) The bottle is packed in borated cotton, in a tin box two inches in diameter and four inches long.

(III) The whole is then inserted, top first, into a second box lined with heavy cotton felt. Both boxes have metal screw-caps, with rubber washers to render them water-tight. The outer box is covered on its outside with paper felt, one-quarter of an inch in thickness. The whole package weighs twelve ounces, and the postage upon it will therefore be twelve cents. The cost of these packages by the hundred will be ten cents each. If the bottle is filled with water and placed uncovered, in its box, and the package is then inverted, the cotton at once absorbs all the water and not a drop can be poured out of the box. If the bottle is filled with water and placed in the package, and the package is then struck with a hammer until it is completely broken down, no water escapes. If the package is crushed by placing it beneath a moving car wheel, no water escapes.

HENRY MITCHELL, *Secretary.*

Replies to the foregoing letter were received from the following:

Dr. George M. Sternberg, Surgeon-General U. S. A.
Dr. A. C. Abbott, University of Pennsylvania.
Dr. R. H. Park, Health Department, New York city.
Dr. T. M. Prudden, College Physicians and Surgeons, New York city.
Dr. G. T. Swartz, State Board of Health, Providence, R. I.
Dr. W. H. Welsh, Johns Hopkins College, Baltimore, Md.
Dr. R. M. Bolton, Health Department, Philadelphia, Pa.

Each of these gentlemen expressed the opinion that no danger would attend the use of the mails for sending diseased specimens if proper mailing packages were employed.

These letters, together with sample mailing cases, were presented to the Hon. W. L. Wilson, Postmaster-General, early in January, 1896, who expressed much interest in the subject, and promised to give it attention.

The following letter was received February 4, 1896:

OFFICE OF THE POSTMASTER-GENERAL,
WASHINGTON, D. C., February 3, 1896.

Dr. Henry Mitchell, Secretary of State Board of Health, Trenton, N. J.:

DEAR SIR:—The modification of the order of Postmaster-General Bissell, to which you called my attention when you were in Washington, has been reached by me to-day, and I have so modified the order as to make it conform to the suggestions of your personal communications.

Very truly yours,
WILLIAM L. WILSON,
Postmaster-General.

The following order was issued February 5, 1896:

OFFICE OF POSTMASTER-GENERAL,
WASHINGTON, D. C., February 5, 1896.

ORDER NO. 88.

Ordered, That the order of the Postmaster-General of June 1, 1893, forbidding the use of the mails for the transmission of specimen germs of cholera, or other diseased tissues, is hereby modified to this extent:

Specimens of diseased tissues may be admitted to the mails for transmission to United States, state or municipal laboratories, only when enclosed in mailing packages constructed in accordance with the specifications hereinafter enumerated. Upon the outside of every such package shall be written, or printed, the words: "Specimen for Bacteriological Examination." No package containing diseased tissue shall be delivered to any representative of any of said laboratories until a permit shall have first been issued by the Postmaster-General, certifying that said institution has been found to be entitled, in accordance with the requirements of this regulation, to receive such specimens.

Specifications for the construction of packages for safely conveying through the mails pathological specimens for bacteriological examination for diagnosis in cases of suspected diphtheria, tuberculosis, and other communicable diseases:

1. The receptacle for specimens of diseased tissues shall be a strong glass vial, having a capacity not greater than four drams. Said vial shall be covered and made water-tight by the use of a metal screw-cap and rubber washer. Said washer shall be at least one-eighth of one inch in thickness.

2. Said vial shall be placed, inverted, in a circular tin box. Said box shall be made of I. C. Bright tin plate, and shall have counter-sunk bottom and soldered joints, and shall have the following dimensions, viz.: diameter two and one-quarter inches, length, three and one-half inches. This box shall be closed by a metal screw-cover and rubber washer, and it shall be so packed with absorbent cotton that the glass vial contained in said tin box shall be evenly surrounded on all sides by said cotton, and said cotton shall be closely laid.

3. Said tin box shall be placed, inverted, inside of a larger tin box, similar to the one already described, but measuring two and three-quarters inches in diameter and four and three-eighths inches in length. Upon the inside of the sides, top and bottom of this outer tin box there shall be at least two layers of porous, corrugated paper felt, each layer to be not less than one sixteenth of one inch in thickness. Said outer tin box shall be closed by a metal screw-cap, and the sides and bottom shall be enveloped in a covering of compressed paper felt, not less than one quarter of an inch in thickness. Said compressed paper felt shall be attached to said tin box by an even layer of hot coal-tar pitch, or other equally adherent material.

William L. Wilson,
Postmaster-General.

After an experience of several months in the use of the specified mailing boxes in connection with the work of the bacteriological laboratory of the New Jersey State Board of Health, certain improvements in the construction of the boxes have seemed desirable, and samples of a new package were exhibited to the postal authorities in Washington, June 3, 1896.

The proposed new box differs from the previous one in the following particulars: The outer paper covering is transferred to the inner side of the tin box, and a test-tube is substituted for the heavy glass vial. The inner tin box is dispensed with, and the weight of the package is much reduced.

I have the honor to append the following communication from the member of this committee appointed for the Republic of Mexico:

Mexico, D. F., August 12, 1896.

Dr. Henry Mitchell, Chairman of the Committee on Transportation of Diseased Tissues by Mail, Trenton, N. J.:

Mr. Chairman:—I have the honor to inform you that the proposition approved by the American Public Health Association in their last meeting at Denver, relating to transportation by mail of specimens for bacteriological uses, and which you sent me, has been presented to the Mexican government.

At first it was approved by the Superior Board of Health of the Federal District, then this body sent it to the Minister of the Interior, and from this minister it was sent to the office of the Communication and Public Works.

I have received information from this office, and I was told that at present the Postal Code is being reformed and that the minister will recommend said proposition to the committee.

I think that in a few months the affair will be arranged.

Very respectfully yours,

DOMINGO ORVAÑANOS.

Letters from Canada lead me to infer that efforts are also being made in that country to secure a modification of the prohibitory order which is now operative there.

Respectfully submitted,

HENRY MITCHELL,

Member of Committee for the United States.

STATISTICS OF VACCINATION AND OF MORTALITY BY SMALL POX IN THE CITY OF MEXICO, FROM 1872 TO 1895.[1]

By Dr. JOSÉ RAMIREZ,

General Secretary of the Supreme Board of Health of the Federal District, Mexico, and Delegate from the State of Yucatan, Mexico.

The statistical data which I present in this paper to the American Public Health Association, refer to the vaccination and the mortality by small pox in the City of Mexico for a period covering twenty-four years. These data are of importance, as they confirm once more the efficacy of that preservative discovered by the illustrious Jenner, and therefore show that in proportion as this preservative is propagated, does the mortality of small pox diminish. The introduction of vaccine into New Spain is an event in the history of Mexico that well merits a special work, in view of its great importance, and especially so, as documents on the subject are plentiful, and from them we can learn of all the efforts that have been made both by private persons, as well as by the authorities of the country, for the dissemination of this precious virus, which has so greatly contributed in preventing the extinction of the human species. In this paper I shall have to confine myself to the task of relating in a few words, how the official vaccine has been preserved in the City of Mexico, and I do so because the fact is of great importance, as will afterwards be seen.

Mr. Angel de Zumarán, second mate of the ship "O," was the first to carry vaccine to the port of Vera Cruz, in the year 1804, and in the month of April of that year the first children were successfully vaccinated in the City of Mexico. A short time after that, the royal expedition, sent by Charles IV, reached this country, under the orders of Dr. Francisco Javier de Balmiz, who, with most praiseworthy zeal personally propagated vaccine, visiting a great number of towns and cities in the Old Spanish colony.

In 1810, Balmiz carried out a second expedition, and on returning to his own country after having fulfilled his humanitarian mission, at the price of abandoning his family, his ease, his comfort, taking the chances of all kinds of climates and regions, traveling round the world, without any thought of the dangers he encountered, he got back to his home, sick and worn out; but leaving his name behind him blessed by future generations.

After the departure of Balmiz, Dr. Antonio Serrano, and the student Don Miguel Muñoz, received from the municipal authorities the commission to preserve the vaccine. From these gentlemen it passed to the hands of Dr. Luis Muñoz, who, in 1872, turned it over to Dr. Fernando Malanco, who, up to this date, has charge of its propagation in the central office, which is dependent on the Superior Board of Health.

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[1] Paper read at the meeting of the American Public Health Association, in Buffalo, Sept., 1896.

Our statistics only include the period during which this service has been under the charge of the Board of Health, that is to say, from June, 1872, up to the end of 1895.

The number of persons vaccinated during these twenty-three years and a half, has been 352,888; the census of the capital shows a population of 344,377, and the general mortality during that period has reached 301,574.

Consequently, the whole population has been vaccinated; but as this preservative has not been applied in a regular way, that is to say, as fast as the births took place, there have been, therefore, times when many children were exposed to disease, a thing that is shown in the tracing of our tables, from which the periods of epidemic and of endemic diseases can easily be made out. The propagation of vaccine in Mexico, has not encountered as many obstacles as in Europe, as all classes of society have been able to understand its benefits, especially the educated middle class and the rich class; and I can certify that amongst these no child remains without vaccination. Although the poor classes, through their ignorance, are guilty of culpable negligence in subjecting their children to the terrible consequences of small pox, yet on the other hand, through the docility of their character, they are easily influenced and induced to adopt this necessary practice. Neither in the political, nor scientific press, nor amongst the medical profession or any academy whatever, has a question been raised on any one occasion as to the advantages of vaccination. Notwithstanding these favorable circumstances, on the petition of the Board of Health vaccination has been declared obligatory ever since the year 1891, and from that period this corporation has reorganized the service, with the satisfactory results that are shown in our table.

The Sanitary Code of the Republic, only provides for revaccination in the army, and this provision is founded on experience, which shows that the vaccine has not degenerated in Mexico, and that one sole inoculation confers immunity from the disease.

These curious and very important facts can only be explained by the other fact, that the vaccine has been preserved for a period of 88 years by five persons and that, having passed through so few hands, it has always been selected with unequalled expertness, and with respect to the permanent immunity which it confers, we must chiefly attribute to the peculiarities of our race.

We cannot present any statistical data with reference to revaccination; but all physicians who have attempted it in Mexico have very soon acquired a conviction of the specially positive results. Revaccination has several times been attempted in the office of the Supreme Board, with the same negative results; but the fact that is best proved by this permanent immunity, is the extreme rarity of any case in which an adult succumbs to small pox, and bearing in mind our own personal memories, as well as those of many other physicians, we cannot refer to a single case of death from this disease.

Another significant fact is the great danger that foreigners who are vaccinated in their own country run of contracting fatal small pox in Mexico. These cases occur with great frequency, and the Board of Health has found itself obliged to invite foreigners to be revaccinated.

Passing now to the figures on mortality by small pox which are shown in our tables, we at once see that there have been three great epidemics; the first was in the year 1872, the year in which the Board took charge of the vaccination service. This was the worst of the epidemics, as the mortality ascended to the enormous figure of 1,767 cases; but, thanks to the activity of the Board in propagating vaccine during the following year, the epidemic was not repeated, and we only had 25 cases. The second epidemic, that of 1877, which coincides with a progressive decrease in the number of vaccinations over those of the three previous years, is explained by the last Civil War. The third epidemic, which came in 1889, as well as the slight ones of 1884 and 1893, can only be accounted for by the continued increase of the population in the capital, and by the circumstances above mentioned, which prevent the timely vaccination of all the children as they are born.

The same phenomenon that was observed in the epidemic of 1872 was repeated in that of 1889, and in the following year we had only 36 cases of small pox,—a thing that is perfectly well accounted for, as in the year 1889 the vaccinations reached their highest figure, that of 26,300 children. Two years afterwards the Board finally reorganized the vaccination service, and we now have well-founded hopes that we shall not see any new epidemic of small pox. In fact during the last year, with a population of 344,377 inhabitants, we had only 16 deaths by that disease, which gives a proportion of 1.10 per thousand in deaths, a result that is highly satisfactory. On the other hand, we had only 19,761 vaccinations in that year, a smaller number than in the previous six years, which is due to the fact, that, almost the entire population having been vaccinated, we could only perform that operation on new-born children, and as these amount to an average per annum which does not rise beyond 15,000, we can feel perfectly certain that the individuals who die in this city, of small pox, must have come from other places to establish their residence in this city.

The limited time at my disposal does not allow me to lay down all the inferences that could be deduced from a study of the accompanying table, in which I show the mortality of small pox during the period treated of; but I certainly can assert that after a careful examination of the data in the Registry, where all deaths are set down, I find a complete confirmation of my statements, and at the same time this Registry furnishes data of the greatest importance for the guidance of the authorities in sanitary legislation, which will result in measures that will finally extinguish small pox in the City of Mexico.

TABLE

Showing the number of vaccinations in the City of Mexico, for a period of twenty-three and one-half years from June, 1, 1872, when this service was put under the charge of the Supreme Board of Health, to December 31, 1895.

Years.	Vaccination.
1872 (from June 1)	4,130
1873	19,299
1874	10,506
1875	11,929
1876	8,859
1877	4,877
1878	4,511
1879	5,662
1880	10,368
1881	11,084
1882	10,967
1883	15,451
1884	15,319
1885	11,981
1886	14,771
1887	147,22
1888	15,387
1889	26,396
1890	23,393
1891	23,702
1892	25,404
1893	23,468
1894	20,936
1895	19,761
Total	352,888

TABLE

Showing general mortality and by small pox from 1872 to 1895.

Years.	General mortality.	Mortality by small pox.	Proportion per 1,000 with relation to small pox.
1872	8,157	1,767	216.62
1873	7,465	25	3.34
1874	8,753	49	5.59
1875	9,343	18	1.92
1876	10,403	133	12.78
1877	12,232	1,138	93.03
1878	10,162	202	19.87
1879	10,207	119	11.65
1880	9,489	331	34.88
1881	9,720	260	26.74
1882	11,577	139	12.00
1883	12,236	84	6.86
1884	12,920	494	38.23
1885	13,170	180	13.66
1886	13,183	166	12.58
1887	13,247	345	26.04
1888	13,272	527	39.70
1889	15,475	820	52.98
1890	16,855	36	2.13
1891	15,343	69	4.49
1892	17,359	82	4.72
1893	20,494	267	13.02
1894	15,974	40	2.50
1895	14,538	16	1.10
	301,574	7,307	24.22

REVISED LIST OF MEMBERS

AMERICAN PUBLIC HEALTH ASSOCIATION,

1897.

This list includes those who have maintained their membership to the present time. The Secretary should be notified of any errors or omissions.

PRESIDENTS OF THE ASSOCIATION.

Stephen Smith, M. D.	1872, '73, '74
*Joseph M. Toner, M. D.	1875
*Edwin M. Snow, M. D.	1876
*John H. Rauch, M. D.	1877
*Elisha Harris, M. D.	1878
*James L. Cabell, M. D.	1879
John S. Billings, M. D.	1880
*Charles B. White, M. D.	1881
Robert C. Kedzie, M. D.	1882
*Ezra M. Hunt, M. D.	1883
Albert L. Gihon, M. D.	1884
*James E. Reeves, M. D.	1885
Henry P. Wolcott, M. D.	1886
George M. Sternberg, M. D.	1887
Charles N. Hewitt, M. D.	1888
*Hosmer A. Johnson, M. D.	1889
Henry B. Baker, M. D.	1890
Frederick Montizambert, M. D.	1891
Felix Formento, M. D.	1892
Samuel H. Durgin, M. D.	1893
Emmanuel P. Lachapelle, M. D.	1894
William Bailey, M. D.	1895
Eduardo Licéaga, M. D.	1896
Henry B. Horlbeck, M. D.	1897

MEMBERS.

Dr. Samuel W. Abbott	Wakefield, Mass.	1882
Dr. Herman Jacoby Achard	Manchester, N. H.	1894
Prof. J. George Adami, M. D., Prof. Pathology McGill University	Montreal, P. Q.	1893

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*Deceased.

Dr. Charles Everett Adams, Director of Gymnasium, Rogers' College	New Brunswick, N. J.	1894
Dr. Charles W. Adams	Kansas City, Mo.	1891
Dr. E. Herbert Adams, Member of Committee on Public Health, Ontario Medical Association,	86 Hazelton Ave., Toronto, Ont.	1894
Dr. J. F. A. Adams	Pittsfield, Mass.	1881
John G. Adams, L. D. S.	346 Yonge St., Toronto, Ont.	1894
C. H. Alden, U. S. A.	Washington, D. C.	1887
Dr. A. C. Alexander, Member Board of Health	Penacook, N. H.	1896
Col. D. S. Alexander	Buffalo, N. Y.	1896
Dr. Edward Alexander	El Paso, Tex.	1892
Dr. Thomas G. Allen	439 Elk St., Buffalo, N. Y.	1896
Dr. T. Johnson Alloway, Professor of Gynecology, McGill University	23 Mackay St., Montreal, P. Q.	1894
Dr. Maxmilean Alvarez	Toluca, Mex.	1896
Miss Mary B. Alward	55 Johnson Park, Buffalo, N. Y.	1896
Dr. B. P. Anderson	Colorado Springs, Col.	1895
John A. Anderson	Lambertville, N. J.	1887
Mr. Scott J. Anthony	Denver, Col.	1895
Mr. U. E. Archambault, Director General of Montreal Catholic Schools	1999 St. Catherine St., Montreal, P. Q.	1894
Dr. S. T. Armstrong	New Rochelle, N. Y.	1892
Dr. J. S. Arwine	Columbus, Ind.	1882
Dr. Joseph Asselin	111 St. Denis St., Montreal, P. Q.	1894
Hon. Edward Atkinson	Boston, Mass.	1889
Dr. Alphonse David Aubry	261 St. Antoine St., Montreal, P. Q.	1894
Dr. Henry Newell Avery, Commissioner of Health,	2548 Nicollet Ave., Minneapolis, Minn.	1895
Sr. Melchor Ayala	Guanajuato, Mex.	1896
Dr. Warren L. Ayer	185 Main St., Owego, N. Y.	1896
Dr. Francisco Martinez Baca	Puebla, Puebla, Mex.	1892
Dr. Morgan L. Bacon	Main St., Wellsboro, Pa.	1896
Dr. Henry I. Bahnson	Salem, N. C.	1888
Dr. William Bailey	Louisville, Ky.	1879
Dr. William C. Bailey	614 Walnut St., Las Vagas, N. M.	1892
Dr. P. H. Bailhache, U. S. M. H. S.	Stapleton, N. Y.	1874
Dr. Henry B. Baker	Lansing, Mich.	1873
Dr. F. W. Baldwin	Danvers, Mass.	1896
H. J. Ball, G. W. P. A., D., L. & W. R. R.	Buffalo, N. Y.	1896
Dr. F. Bancroft	Denver, Col.	1887
Dr. F. J. Bancroft	397 Grant Ave., Denver, Col.	1895
Dr. Charles Edward Banks, U. S. Marine Hospital Service	Portland, Me.	1894
Sr. Mariano Barcena, Director del Observatorio Central,	Mexico, Mex.	1892
Dr. William F. Barclay	1620 Fifth Ave., Pittsburg, Pa.	1895
Dr. George E. Baril	324 St. Catherine St., Montreal, P. Q.	1894
Dr. Henry Jabez Barnes	429 Beacon St., Boston, Mass.	1896

Dr. George W. Barr	18 Washington St., Titusville, Pa.	1896
Dr. Felix Barrett	Westbrook, Me.	1894
James W. Bartlett	Dover, N. H.	1888
Dr. Elias Hudson Bartley	21 Lafayette Ave., Brooklyn, N. Y.	1890
Dr. Newton L. Bates, Medical Director, U. S. Navy, Director U. S. Naval Museum of Hygiene	Washington, D. C.	1895
Dr. Samuel W. Battle, U. S. A.	Asheville, N. C.	1887
Dr. Joseph Beaudin, Officier de Sante	Hull, P. Q.	1894
Dr. J. A. Beaudrey	65 St. Denis St., Montreal, P. Q.	1889
Dr. Frederick Becker	Clermont, Iowa.	1889
Dr. D. H. Beckwith	Cleveland, Ohio.	1884
Dr. Henry E. Beebe	Sidney, Ohio.	1882
F. L. Beique, Esq., Queen's Counsel,	954 Sherbrooke St., Montreal, P. Q.	1894
Dr. A. N. Bell	337 Clinton St., Brooklyn, N. Y.	1872
Dr. James Bell, President Montreal Medico-Chirurgical Society	873 Dorchester St., Montreal, P. Q.	1894
Dr. Norman W. Bellrose, City Physician and Health Officer	Eaton, Col.	1895
Dr. J. M. Benitz	Guadalajara, Jalisco, Mex.	1892
Dr. Emmanuel Persillier Benoit,	476 Sherbrooke St., Montreal, P. Q.	1894
Morris Benson	Buffalo, N. Y.	1896
Dr. David H. Bergey	34th and Locust Sts., Philadelphia, Pa.	1894
Dr. Francisco Bernaldez	Estampa-Merced 5, Mexico, Mex.	1892
Mr. L. A. Bernard	1882 St. Catherine St., Montreal, P. Q.	1894
Dr. Michael Beshoar	Trinidad, Col.	1895
Dr. John S. Billings, U. S. A.	40 Lafayette Place, New York City.	1872
Dr. H. A. Birkett, Lecturer in Laryngology, McGill University	123 Stanley St., Montreal, P. Q.	1894
Charles F. Bishop	Seneca St., Buffalo, N. Y.	1896
Dr. William T. Bishop	Harrisburg, Pa.	1889
Arthur D. Bissell	People's Bank, Buffalo, N. Y.	1896
Hon. Wilson S. Bissell	Ellicott Sq., Buffalo, N. Y.	1896
Dr. A. D. Blackadder, Professor of Pharmacology and Therapeutics, McGill University	236 Mountain St., Montreal, P. Q.	1894
Dr. Emily Blackwell	53 E. 20th St., New York City.	1873
Dr. Victor Alexander Bles	1274 Marion St., Denver, Col.	1895
Dr. Frans H. Bodenius	Madison, Wis.	1888
Adam Boeckel	Seneca St., Buffalo, N. Y.	1896
Dr. Mary A. Boland	117 West Newton St., Boston, Mass.	1891
Alexandre Bonnin, I. C., Professor á l'École Polytechnique	247 St. Hubert St., Montreal, P. Q.	1894
Dr. Seraphin Boucher	1133 Ontario St., Montreal, P. Q.	1894
Dr. Abraham H. Bowers	5 East 2d St., Jamestown, N. Y.	1896
Dr. A. H. Bowker, Health Officer	Berlin, N. H.	1896
Dr. Elmer Thomas Boyd	Leadville, Col.	1895
Dr. Henry Martyn Bracken, Member State Board of Health	1010 Fourth St., Minneapolis, Minn.	1895

William H. Bradish, Real Estate Exchange . . . Buffalo, N. Y. 1896
Dr. Harry E. Bradley, Acting Commissioner of Health . . . . 208 Wisconsin St., Milwaukee, Wis. 1895
Dr. Julius Braunnagel . . 250 South Laredo St., San Antonio, Tex. 1890
Dr. Carlos Brava . . . . Colima, Mex. 1896
Dr. Charles W. Bray . . . . Portland, Me. 1894
Dr. Sarah H. Brayton . . . . Evanston, Ill. 1893
Dr. T. M. Brennan, Professor Laval University . . . Montreal, P. Q. 1894
Dr. Max Breuer . . . . . Virginia and Pearl Sts., Buffalo, N. Y. 1896
Dr. F. W. Brewer . . . . Chicago, Ill. 1892
Prof. William H. Brewer . . . . New Haven, Conn. 1874
Dr. Alexander B. Briggs, Member State Board of Health . . . . Ashaway, R. I. 1895
Dr. A. H. Briggs . . . . . Hudson and West Ave., Buffalo, N. Y. 1896
John C. Brimblecom, Agent and Clerk Board of Health, West Newton, Mass. 1896
John M. Brinker, Coal and Iron Exchange . . . . Buffalo, N. Y. 1896
Dr. A. T. Brosseau, Professor de Clinique Externea l'Universite Laval . . . . . . 138 St. Denis St., Montreal, P. Q. 1894
Dr. A. H. Brown . . . . 7 Williams St., Auburn, N. Y. 1896
Dr. H. D. Brown . . . . 79 Market St., Potsdam, N. Y. 1896
Joseph O. Brown . . . . Pittsburg, Pa. 1888
Dr. Gaius M. Brumbaugh . . 904 Mass. Ave., Washington, D. C. 1896
Dr. William Francis Brunner . . . 50 Harris St., Savannah, Ga. 1890
Dr. Peter H. Bryce . . . . Toronto, Ont, 1883
Dr. Erastus J. Buck . . . . Platteville, Wis. 1888
Dr. Frank Bullen, Professor of Ophthalmology, McGill University . . . . 111 Drummond St., Montreal, P. Q. 1894
Dr. Robert Burns, Health Officer . . . . Plymouth, N. H. 1894
Dr. Charles Jenkins Burroughs, 119 W. Church St., Jacksonville, Fla. 1892
Peter P. Burtis . . . . Hodge Ave., Buffalo, N. Y. 1896
E. B. Byington, G. W. P. A., L. V. R. R. . . . . Buffalo, N. Y. 1896
Dr. José Maria Calderon . . . . Puebla, Puebla, Mex. 1892
Dr. Allan Cameron . . . . Owen Sound, Ont. 1886
Dr. J. Chalmers Cameron, Professor of Obstetrics and Diseases of Infancy, McGill University . . . . . 941 Dorchester St., Montreal, P. Q. 1894
Dr. E. R. Campbell . . . . Bellows Falls, Vt. 1894
Dr. James Campbell, President Hartford Board of Health . . . . Hartford, Conn. 1888
Dr. William Robertson Campbell, 34 Niagara St., Niagara Falls, N. Y. 1896
Dr. James Willis Candee, Health Commissioner . . 402 Warren St., Syracuse, N. Y. 1896
Dr. A. W. Cantwell . . . . Davenport, Iowa. 1880
Dr. Luis S. Carmona . . . . Mexico, Mex. 1896
Dr. Manuel Carmona y Valle . . . . Mexico, Mex. 1892
Mr. C. Henri Carrier . . . . Levis, P. Q. 1894

Dr. Edwin H. Carter, President Iowa State Board of Health	Des Moines, Iowa.	1896
Dr. Laurent Catellier	31 Dauphine St., Quebec, P. Q.	1894
Dr. Charles S. Caverly, President of State Board of Health	Rutland, Vt.	1894
Dr. David Cerna	Galveston, Tex.	1896
Dr. Augustin Chacon	Ortega 10, Mexico, Mex.	1892
Dr. Eloi Philippe Chagnon, Physician to the Hospital for the Insane	Longue Pointe, P. Q.	1894
Prof. Stanford E. Chaillé	New Orleans, La.	1874
Prof. C. F. Chandler	41 E. 49th St., New York City.	1872
David D. Chandler, Health Officer	74 No. 7th St., Newark, N. J.	1896
Dr. Charles V. Chapin	Providence, R. I.	1886
Mr. John Henry Chapman	2294 St. Catherine St., Montreal, P. Q.	1894
Dr. Joseph B. Charette, Medicin Municipal de Notre Dame des Neiges	Cote des Neiges, P, Q.	1894
Dr. Herman L. Chase, Health Officer	Brookline, Mass.	1895
John C. Chase, C. E.	Derry, N. H.	1890
Dr. Tomas Chavez	Leandro Valle 1, Guanajuato, Guanajuato, Mex.	1892
Dr. Jesus Chico	2 Estrella St., Guanajuato City, Guanajuato, Mex.	1891
Dr. Thomas Teasdale Church	70 E. Main St., Salem, Ohio.	1890
Dr. Jno. H. Cipperly, Health Officer	131 Second St., Troy, N. Y.	1896
Dr. C. D. Clark, Member State Board of Health	Minneapolis, Kan.	1895
Dr. Edward Clark	Franklin St., Buffalo, N. Y.	1896
Dr. Gardner C. Clark	Niagara Falls, N. Y.	1896
Harry W. Clark, Experiment Station	Lawrence, Mass.	1986
Dr. Joseph C. Clark, Health Officer	15 Lawreno St., Olean, N. Y.	1896
Dr. A. P. Clarke	Cambridge, Mass.	1887
Dr. L. J. V. Clerouse	1105 Ontario St., Montreal, P. Q.	1894
Dr. J. B. Coakley	339 Delaware Ave., Buffalo, N. Y.	1896
James C. Coffey, Health Officer	Worcester, Mass.	1896
Dr. John W. Collins	Grand Junction, Col.	1895
Dr. C. S. Collins, Member State Board of Health	Nashua, N. H.	1896
Mr. W. C. R. Colquhoun, Secretary Health Department,	Wilmington, Del.	1894
Dr. G. P. Conn	Concord, N. H.	1875
Dr. P. S. Conner	Cincinnati, Ohio.	1884
Dr. Angel Contreras	Mesones 7, Puebla, Puebla, Mex.	1892
Dr. Willis C. Cook, Health Officer	King St., Brockport, N. Y.	1896
Dr. I. Cormier	Montreal, P. Q.	1894
Dr. Aaron Cornish	155 William St., New Bedford, Mass.	1892
William C. Cornwell, City Bank	Buffalo, N. Y.	1896
Dr. Richard W. Corwin	Pueblo, Col.	1895
Dr. George Edwin Coulthard, Secretary Provincial Board of Health of New Brunswick,	18 Carleton St., Fredericton, N. B.	1894
Dr. C. W. Covernton	Toronto, Ont.	1884
Dr. John Coventry	Windsor, Ont.	1886

Dr. G. G. Craig	Rock Island, Ill.	1880
Dr. Robert Craik, Dean of Medical Faculty of McGill University	887 Sherbrooke St., Montreal, P. Q.	1894
J. James R. Croes, C. E.	68 Broad St., New York City.	1877
Rev. Patrick Cronin, "Catholic Times"	Buffalo, N. Y.	1896
Dr. Thomas D. Crothers, Superintendent Walnut Lodge Hospital	Hartford, Conn.	1894
Dr. Henry Cooper Crouch, Bacteriologist Denver Health Office, Barth Block	Denver, Col.	1895
Mr. Thomas P. Culloton, National Association of Master Plumbers	50 N. Clark St., Chicago, Ill.	1895
Dr. William M. Cummings, Health Officer, Bent County,	Los Animos, Col.	1895
Dr. David M. Currier	Newport, N. H.	1883
Dr. F. C. Curtis	Albany, N. Y.	1883
Dr. William Thomas Dalby	Salt Lake City, Utah.	1894
Dr. B. H. Daggett	Buffalo, N. Y.	1896
Dr. R. P. Daniell	Jacksonville, Fla.	1890
Hon. Charles Daniels	North St., Buffalo, N. Y.	1896
Dr. Hiram H. Darr	Caldwell, Tex.	1883
Dr. James Darrach	Germantown, Pa.	1874
Mr. Robert Davidson, Health Officer,	52 Market St., Sherbrooke, P. Q.	1894
Dr. John Chapman Davie, Chairman Provincial Board of Health	Victoria, B. C.	1896
Prof. Floyd Davis, Ph. D.	Des Moines, Ia.	1890
Hon. George A. Davis	Ellicott Sq., Buffalo, N. Y.	1896
Dr. N. S. Davis	65 Randolph St., Chicago, Ill.	1887
Mark Alexander Dawes, V. S., Inspector of Milk and Dairies	24 Stanley St., Montreal, P. Q.	1894
Dr. Howard Henderson Dawson, County Physician	Rico, Col.	1895
Dr. Dwight W. Day	Eau Claire, Wis.	1888
Dr. Henry Day, Member State Board of Health of Wisconsin	Eau Claire, Wis.	1894
William H. Dean, E. M. A. C.	89 West River St., Wilkesbarre, Pa.	1896
Dr. James Osbourne DeCourcy	St. Liborg, Ill.	1895
Dr. J. N. DeHart	Brooklyn, N. Y.	1896
Dr. Louis Avila Demero	139 Berri St., Montreal, P. Q.	1894
Dr. William Champion Deming, Medical Sanitary Inspector, New York City Board of Health	West Chester, N. Y.	1895
Dr. Charles Denison	1625 Logan Ave., Denver, Col.	1895
Dr. Laban Dennis	Newark, N. J.	1877
Dr. William P. Derby	66 Beacon St., Boston, Mass.	1896
George W. Derrick	Buffalo, N. Y.	1896
Dr. Emil A. de Schweinitz, Chemist Bureau of Animal Industry	Washington, D. C.	1896
Dr. Jean Charles Prosper Frederic Despars, Medicin Officier de Sante	98 Mendon St., St. Hyacinthe, P. Q.	1894
Dr. Israel Joseph Desroches	226 St. Denis St., Montreal, P. Q.	1894

Dr. Francois H. De Vaux, Superintendent State Board of Health	Valley City, N. D.	1894
Dr. C. DeWitt	Fort Monroe, Va.	1895
Charles E. Dickinson, Secretary Northern Finance Company	1601 Logan Ave., Denver, Col.	1895
Dr. S. M. Dinsmore	Keene, N. H.	1896
Dr. Arah Dixon, Member State Board of Health	Henderson, Ky.	1894
William E. Dodge, Jr.	11 Cliff St., New York City.	1874
Dr. Florence O. Donohue	Syracuse, N. Y.	1891
Dr. L. Bradley Dorr, Jefferson St.	Buffalo, N. Y.	1896
Alvah H. Doty, M. D., Port Health Officer,	Rosebank, Staten Island, N.Y.	1896
Dr. James Edmund Downs, President United States Pension Board	400 Main St., Aspen, Col.	1895
Dr. Gregory Doyle, Health Commissioner,	307 W. Genesee St., Syracuse, N. Y.	1896
Dr. Thomas M. Drown	South Bethlehem, Pa.	1887
Dr. Joseph Alfred Duchesneau	Terrebonne, P. Q.	1894
Dr. Charles P. Dudley	Altoona, Pa.	1888
Joseph P. Dudley	Buffalo, N. Y.	1896
Dr. Samuel P. Duffield	Dearborn, Mich.	1891
Charles H. Dunbar	Buffalo, N. Y.	1896
Dr. S. A. Dunham	180 Chippewa St., Buffalo, N. Y.	1896
Dr. Emmanuel E. Duquet, Medical Superintendent of Longue Pointe Asylum	Longue Pointe, P. Q.	1894
Dr. Samuel H. Durgin, 12 Beacon St.	Boston, Mass.	1875
Dr. Henry A. Dykes, 600 Market St.	Chattanooga, Tenn.	1895
Dr. Benjamin Franklin Eads	Marshall, Tex.	1892
Dr. James B. Eagleson, President State Board of Health, 512 Burke Building	Seattle, Wash.	1896
Dr. Wallace E. Edgerton	Salem, S. D.	1892
Dr. P. O'M. Edson	249 Warren St., Boston, Mass.	1895
Dr. John Elsner	Denver, Col.	1887
Dr. Z. Taylor Emery, Commissioner of Health,	831 Washington Ave., Brooklyn, N. Y.	1894
Dr. Alfonso Ruis Erdozain	Hidalgo, Mex.	1896
Dr. James Buddington Erskine, Chairman Board of Health	Colebrook, N. H.	1894
Edwin T. Evans	North St., Buffalo, N. Y.	1896
Dr. James W. Exline, Professor of Hygiene and State Medicine, Gross Medical College	Denver, Col.	1895
Dr. George L. Eyster	1109 Second Ave., Rock Island, Ill.	1891
Frank L. Fales, C. E., Asst. Engineer Experiment Station, Massachusetts State Board of Health (Care Essex Co.)	3 Mont Vernon St., Boston, Mass.	1893
Prof. Delos Fall	Albion, Mich.	1889
Dr. Edwin Farnham	Cambridge, Mass.	1889
A. B. Farquar, Esq.	York, Pa.	1880

C. M. Farrar	Perry St., Buffalo, N. Y.	1896
J. A. Fellows, G. P. A., W. N. Y. & P. R. R.	Buffalo, N. Y.	1896
Byron Fenner	Westfield, N. Y.	1896
Dr. Henry Marshall Fenno	77 W. Main St., Rochester, N. Y.	1892
Dr. F. Ferguson	20 W. 38th St., New York City.	1892
Dr. J. D. Fernandez	Jacksonville, Fla.	1890
George S. Field	Buffalo, N. Y.	1896
Dr. Samuel Augustus Fisk, Professor and Secretary, Medical Department, University of Denver	37 Eighteenth Ave., Denver, Col.	1894
Gustav Fleischmann	Spring St. and Broadway, Buffalo, N. Y.	1896
Dr. Louis Fleischmann	788 Broadway, New York City.	1890
Dr. Alexander Fleming	Brandon, Manitoba.	1896
Richard Philip Fleming, C. E., Resident Engineer of the Montreal Sanitary Association	157 St. James St., Montreal, P. Q.	1894
Dr. Lawrence F. Flick	736 Pine St., Philadelphia, Pa.	1890
Dr. James Leslie Foley	55 Union Ave., Montreal, P. Q.	1894
Dr. Charles Jenkins Foote, Bacteriologist	305 Howard Ave., New Haven, Conn.	1895
Dr. William H. Ford	1622 Summer St., Philadelphia, Pa.	1874
Lucien Forget	Montreal, P. Q.	1894
George V. Forman	Erie Co. Bank Building, Buffalo, N. Y.	1896
Dr. Felix Formento	New Orleans, La.	1880
Dr. Emile Rene Fortier	130 Ste. Anne St., Quebec, P. Q.	1894
Dr. Louis Edouard Fortier	Montreal, P. Q.	1894
Dr. Eugene Foster	Augusta, Ga.	1881
Dr. George S. Foster	Putney, Vt.	1893
Dr. Auguste Achille Foucher, Professor Laval University	96 St. Denis St., Montreal, P. Q.	1894
Dr. Joseph Fowler,	141 Delaware Ave., Buffalo, N. Y.	1896
B. P. Fraser, P. A., Penn. R. R.	Buffalo, N. Y.	1896
Dr. C. C. Frederick	Richmond Ave., Buffalo, N. Y.	1896
Dr. Spencer M. Free	DuBois, Pa.	1885
Henry C. French	Ellicott Square, Buffalo, N. Y.	1896
Dr. G. D. Frost, Member Board of Health	Hanover, N. H.	1896
Robert L. Fryer	Ellicott Square, Buffalo, N. Y.	1896
George W. Fuller, Bacteriologist	549 Third St., Louisville, Ky.	1893
Dr. W. H. Gail	East Aurora, N. Y.	1896
Dr. Adrian de Garay	Mexico, Mex.	1892
Dr. Salvador Garciadiego	Guadalajara, Jalisco, Mex.	1892
Dr. John H. Gardiner, Member of London Board of Health	London, Ont.	1894
Dr. Wm. Gardner, Professor of Gynecology, McGill University	109 Union Ave., Montreal, P. Q.	1894
Dr. Juan F. De La Garza	Laredo, Tamaulipas, Mex.	1896
Dr. Franklin Gauntt	Burlington, N. J.	1885

Dr. J. E. S. Gauthier, Gouverneur du College des Medicins	Upton, P. Q.	1894
Dr. Louis Edmond Gauvreau, Director Vaccine Institute	Quebec, P. Q.	1894
Dr. A. Gaviño	Ratas No. 4, Mexico, Mex.	1891
Dr. Adolph A. Gehrmann, City Bacteriologist,	3816 Ellis St., Chicago, Ill.	1895
William Paul Gerhard, C. E.	36 Union Sq , New York City.	1880
Dr. John Gerin, Health Commissioner	68 North St., Auburn, N. Y.	1896
Dr. Alexander Germain	453 Rachel St., Montreal, P. Q.	1894
Dr. Frederic H. Gerrish	Portland, Me.	1885
Prof. Wolcott Gibbs	Newport, R. I.	1876
Dr. W. T. Giddings	Gardiner, Me.	1894
Dr A. Gifford	917 Mass. Ave., Lawrence, Kan.	1895
Dr. Willis B. Gifford, Health Officer	Attica, N. Y.	1896
Dr. Albert L. Gihon, U. S. N.	233 5th Ave., New York City.	1876
John C. Glenny	Main St., Buffalo, N. Y.	1896
Dr. John N. Goltra	441 Elmwood Ave., Buffalo, N. Y.	1896
Dr. Edward C. Goodrich	201, 202 Dyer Building, Augusta, Ga.	1892
Dr. R. S. Goodwin	Thomaston, Conn.	1886
Dr. J. Adelphi Gottleib, Professor Forensic Medicine	304 West 104th St., New York City.	1894
Dr. George G. Groff, Member Pennsylvania State Board of Health and Agriculture, Professor in Bucknell College	Union St., Lewisburgh, Pa.	1894
Dr. Franklin C. Gram, Health Department	Buffalo, N. Y.	1896
W. H. Gratwick	Ellicott Square, Buffalo, N. Y.	1896
Dr. E. E. Graves	Boscawen, N. H.	1886
Mr. Crosby Gray	Pittsburgh, Pa.	1874
Henry R. Gray	144 St. Lawrence Main, Montreal, P. Q.	1886
Samuel M. Gray, C. E.	174 Weybosset St., Providence, R. I.	1891
Dr. James T. Greeley, President Board of Health	Nashua, N. H.	1896
Dr. Mary E. Greene	Lawrence Ave., Charlotte, Mich.	1896
Dr. Walter D. Greene	385 Jersey St., Buffalo, N. Y.	1896
Dr. Edgerton Griffin, Medical Health Officer	370 Colbune St., Brantford, Ont.	1886
Dr. John Griffin	90 Sands St., Brooklyn, N. Y.	1888
P. Henry Griffin	North St., Buffalo, N. Y.	1896
Dr. Jefferson D. Griffith	Kansas City, Mo.	1891
Dr. Burton B. Grover, Health Officer	Colorado Springs, Col.	1895
Dr. Edward A. Guilbert	Dubuque, Iowa.	1890
E. B. Guthrie, City Engineer	Buffalo, N. Y.	1896
Dr. Manuel Gutierrez	13 Aduana Vieja, Mexico, Mex.	1891
Dr. Jacob Moyer Hagey	Mt. Morris, N. Y.	1892
Dr. William R. Hall	40 King St., Chatham, Ont.	1896
Dr. John B. Hamilton	61 Market St., Chicago, Ill.	1886
Dr. J. H. Hamilton	Richford, Vt.	1891

C. J. Hamlin	Delaware Ave., Buffalo, N. Y.	1896
Dr. Joseph Warren Hancock, Member Wisconsin State Board of Health	Ellsworth, Wis.	1894
Dr. Lawrence G. Hanley	Seneca St., Buffalo, N. Y.	1896
D. W. Harrington	Cold Springs, Buffalo, N. Y.	1896
Mrs. Henry Harrington	1080 Grant Ave., Denver, Col.	1895
Dr. George Wood Harrison, Member State Board of Health	404 Second St., Ashland, Wis.	1896
Dr. James A. Hart	802 N. Nevada Ave., Colorado Springs, Col.	1895
Dr. J. N. Harty	Indianapolis, Ind.	1896
Maj. Philip Francis Harvey, Surgeon U. S. A., Plattsburgh Barracks	Plattsburgh, N. Y.	1894
Josiah Hartzell, Ph. D., Member State Board of Health	Canton, Ohio.	1895
Dr. W. A. Haskell	Alton, Ill.	1883
A. G. Hauenstein	Ellicott Square, Buffalo, N. Y.	1896
Edmund Hayre	North St., Buffalo, N. Y.	1896
Dr. George Stevens Hazard, Health Officer	Hollis, N. H.	1896
Allen Hazen, C. E.	220 Broadway, New York City.	1892
Dr. W. H. Heath	Franklin and Court Sts., Buffalo, N. Y.	1896
A. E. Hedstrom	Buffalo, N. Y.	1896
R. R. Hefford	Merchants' Exchange, Buffalo, N. Y.	1896
Dr. John Lorenzo Heffron, Professor Therapeutics and Clinical Medicine, Syracuse University, College of Medicine	448 South Salina St., Syracuse, N. Y.	1894
William Hengerer	Buffalo, N. Y.	1896
Mr. Charles P. Herbert	Champ de Mars St., Montreal, P. Q.	1894
Rudolph Hering, C. E.	100 William St., New York City.	1878
Dr. J. H. Heron	Salt Lake City, Utah.	1895
Dr. Edgar P. Hershey	408 California Building, Denver, Col.	1895
Dr. Charles N. Hewett	Red Wing, Minn.	1872
Dr. James F. Hibberd	Richmond, Ind.	1881
Hibbert Hill	441 Sackville St., Toronto, Ont.	1896
John W. Hill, C. E.	35 Glenn Building, Cincinnati, Ohio.	1896
Dr. W. H. Hingston, Professor of Clinical Surgery	Montreal, P. Q.	1894
Dr. F. Whitehill Hinkel	Delaware Ave., Buffalo, N. Y.	1896
Dr. Carleton E. Hoadley, Health Officer	116 Church St., New Haven, Conn.	1896
Dr. Cornelius N. Hoagland	410 Clinton Ave., Brooklyn, N. Y.	1887
Dr. Charles A. Hodgetts, Member Executive Health Officers' Association of Ontario	8 St. Patrick St., Toronto, Ont.	1894
Dr. Charles Henry Holcombe	Brookline, N. H.	1894
Dr. Erastus Eugene Holt, Executive and Senior Attending Surgeon of Maine Eye and Ear Infirmary	723 Congress St., Portland, Me.	1894
Dr. Henry D. Holton	Brattleboro, Vt.	1875
Dr. George Homan	919 Olive St., St. Louis, Mo.	1879

Dr. William G. Hoopes, President Board of Health	Atlantic City, N. J.	1896
Dr. Henry R. Hopkins	433 Franklin St., Buffalo, N. Y.	1894
Dr. H. B. Horlbeck	Charleston, S. C.	1880
George R. Howard	Buffalo, N. Y.	1896
Dr. Lucien Howe	183 Delaware Ave., Buffalo, N. Y.	1896
Dr. Henry F. Hoyt	St. Paul, Minn.	1884
Dr. J. Elizabeth Hoyt	85 North State St., Concord, N. H.	1895
Dr. A. A. Hubbell	Franklin St., Buffalo, N. Y.	1896
Dr. William H. Huger	Charleston, S. C.	1890
William Q. Huggins, Health Officer	Sanborn, N. Y.	1896
Mr. J. W. Hughes, Master Plumber	747 Craig St., Montreal, P. Q.	1894
Joseph Hunsicker, Ellicott Club	Buffalo, N. Y.	1896
Dr. A. Clark Hunt	Metuchen, N. J.	1888
Dr. C. C. Hunt	Dixon, Ill.	1889
Dr. Simeon Hunt	Warren Ave. and 2d St., E. Providence, R. I.	1896
Charles R. Huntley	General Electric Co., Buffalo, N. Y.	1896
Harvey I. Hurd	Ellicott Square, Buffalo, N. Y.	1896
Dr. H. M. Hurd	Baltimore, Md.	1883
Dr. John N. Hurty, Secretary State Board of Health	29 East Second St., Indianapolis, Ind.	1896
Jno. B. Hutchinson	187 St. James St., Quebec, P. Q.	1894
Dr. Theophilus V. Hutchinson, City Health Officer	London, Ont.	1896
Dr. Maxell S. Inglis, Health Officer	Winnipeg, Manitoba.	1894
Dr. Mary de Booy Ingram	196 Joralemon St., Brooklyn, N. Y.	1896
Lawrence Irwell, M. A., B. C. L.	76 W. Tupper St., Buffalo, N. Y.	1896
Dr. Edward Jackson	McPhee Building, Denver, Col.	1895
Dr. Frank S. Jackson	Dunkirk, N. Y.	1896
Dr. William H. Jackson, Health Officer	38 Main St., Springville, N. Y.	1896
Dr. Bushrod W. James	Cor. 18th and Green Sts., Philadelphia, Pa.	1878
F. H. James	Board of Trade, Buffalo, N. Y.	1896
Dr. John H. James	Elkton, Md.	1895
Dr. William T. Jenkins	Quarantine, Staten Island, N. Y.	1892
Dr. James W. Jenney	Salina, Kan.	1891
Hon. Edgar B. Jewett, Mayor	Buffalo, N. Y.	1896
Dr. Sam C. Johnson	Hudson, Wis.	1883
Dr. Wyatt Johnson	St. James Club, Montreal, P. Q.	1892
Dr. Charles Sumner Jones	Delaware Ave., Buffalo, N. Y.	1896
Dr. D. C. Jones	Topeka, Kan.	1887
Dr. Leander P. Jones	Greenwich, Conn.	1889
Dr. S. Case Jones, New York State Commissioner of Health	21 East Ave., Rochester, N. Y.	1895
Edward C. Jordan, C. E.	Portland, Me.	1886
Dr. R. D. Kahle, Member State Board of Health	Lima, O.	1893
Dr. Lee Kahn, City Physician	501 Harrison Ave., Leadville, Col.	1894
C. H. Keefer, C. E.	Ottawa, Ont.	1896
Dr. Wilhelm H. Keller, Health Officer	Stony Point, N. Y.	1896
Dr. J. H. Kellogg	Battle Creek, Mich.	1878

Dr. J. F. Kennedy	Des Moines, Iowa.	1885
Dr. G. M. Kimball	Concord, N. H.	1886
Dr. James P. Kimball, U. S. A.	Governor's Island, N. Y.	1892
Dr. Byron F. Kingsley	Cor. Elm and Starr, San Antonio, Tex.	1892
Dr. J. J. Kinyoun, U. S. M. H. S.	Washington, D. C.	1895
Dr. Robert Charles Kirkpatrick, Demonstrator of Surgery, McGill University, Surgeon to Montreal General Hospital	163 Mansfield St., Montreal, P. Q.	1894
Dr. Thomas Kirkpatrick, Secretary State Board of Health	821 Kansas Ave., Topeka, Kan.	1895
Dr. S. P. B. Knox, A. M.	912 Anacapa, Santa Barbara, Cal.	1892
Dr. William F. Knox	McKeesport, Pa.	1887
Dr. George M. Kober	1718 Q St., Washington, D. C.	1896
Emil Kuichling, C. E.	Rochester, N. Y.	1882
Dr. Emmanuel P. Lachapelle	Montreal, P. Q.	1887
Dr. Severin Lachapelle, Professor Laval University,	2606 Notre Dame St., Montreal, P. Q.	1894
Dr. J. R. Laine, Secretary State Board of Health	913 K St., Sacramento, Cal.	1895
Dr. Joseph Lancetol	St. Henri St., Montreal, P. Q.	1894
Dr. Francois Joseph Langlais, Officer de Sante	Trois-Pistoles, P. Q.	1894
Dr. Joseph E. A. Lanouette	1034 Elm St., Manchester, N. H.	1894
Dr. Joseph Edouard Laberge	429 St. Hubert St., Montreal, P. Q.	1894
Dr. Louis Laberge	Montreal, P. Q.	1886
Dr. S. W. Latta	Trenton, N. J.	1885
George E. Laverack	Washington St., Buffalo, N. Y.	1896
Prof. James Law	Ithaca, N. Y.	1872
Dr. Reginald Barkley Leach, Secretary Board of Health,	Paris, Tex.	1894
Dr. John Lainy Leal	149 Ellison St., Paterson, N. J.	1891
Dr. John B. Learned	Florence, Mass.	1889
Dr. Benjamin Lee	1522 Pine St., Philadelphia, Pa.	1874
L. Z. Leiter, Esq.	P. O. Drawer L, Chicago, Ill.	1876
William T. Lemp	St. Louis, Mo.	1884
Dr. Robert Leroy	Denver, Col.	1895
Joseph Lessard, President of the Board of Inspectors of Industrial Establishments and Public Buildings	259 St. Hubert St., Montreal, P. Q.	1894
Ogden P. Letchworth	Buffalo, N. Y.	1896
Hon. William P. Lethworth	Glen Iris, Portageville, N. Y.	1874
Dr. Daniel Lewis	249 Madison Ave., New York City.	1894
Dr. F. Park Lewis	Franklin St., Buffalo, N. Y.	1896
Dr. Francis W. Lewis	2016 Spruce St., Philadelphia, Pa.	1874
George A. Lewis	Lewis Block, Buffalo, N. Y.	1896
G. E. Ross-Lewis, Cashier First National Bank	1912 Logan Ave., Denver, Col.	1895
George L. Lewis	Buffalo, N. Y.	1896
Dr. Richard H. Lewis	Raleigh, N. C.	1892

Dr. Eduardo Licéaga	4 San Andres St., Mexico, Mex.	1891
Dr. Charles A. Lindsley	New Haven, Conn.	1875
Dr. J. Berrien Lindsley	Nashville, Tenn.	1877
H. H. Littell	Buffalo, N. Y.	1896
Dr. Rafael Loaiza	Tlaxcala, Mex.	1896
Franklin D. Locke	Erie St., Buffalo, N. Y.	1896
George L. Locke, D. D.	Bristol, R. I.	1894
Dr. A. L. Lockhart, Assistant Gynecologist to the Montreal General Hospital	59 Metcalfe St., Montreal, P. Q.	1894
Dr. Tomas Lorek	Zacatecas, Mex.	1895
Dr. Thomas Lothrop	Delaware Ave., Buffalo, N. Y.	1896
Dr. W. J. Lumsden	Elizabeth City, N. C.	1892
Dr. John D. MacDonald, Chairman Provincial Board of Health	28 Duke St. Hamilton, Ont.	1894
Mr. John J. Mackenzie, B. A., Analyst Provincial Board of Health	Parliament Building, Toronto, Ont.	1894
Dr. J. M. Mackie	Portage la Prairie, Manitoba.	1896
Dr. Andrew Macphail, Professor of Pathology, University of Bishop's College	2430 St. Catherine St., Montreal, P. Q.	1894
Frank Maischoss	Chicago St., Buffalo, N. Y.	1896
Mr. Eric Mann, Architect	30 St. John St., Montreal, P. Q.	1894
George E. Mann	Buffalo, N. Y.	1896
Dr. M. D. Mann	Allen St., Buffalo, N. Y.	1896
William L. Marcy	Erie Co. Bank Building, Buffalo, N. Y.	1896
Dr. Francisco Marin	Puebla, Puebla, Mex.	1891
Dr. Solon Marks	Milwaukee, Wis.	1876
Dr. C. H. Marquardt, Physician and Surgeon, Member State Board of Health	La Crosse, Wis.	1893
Dr. Miguel Marquez	Chihuahua, Chihuahua, Mex.	1892
Dr. E. J. Marsh	600 Park Ave., Paterson, N. J.	1872
Charles D. Marshall	Erie Co. Savings Bank, Buffalo, N. Y.	1896
Dr. Thomas Masson	Cape Vincent, N. Y.	1896
George B. Mathews	Merchants' Exchange, Buffalo, N. Y.	1896
Dr. J. M. Mathews, President State Board of Health,	923 4th St., Louisville, Ky.	1895
George E. Matthews	Express, Buffalo, N. Y.	1896
Dr. Ezra S. McClellan	Saranac Lake, N. Y.	1889
D. J. H. McClelland	5th and Williams Ave., Pittsburg, Pa.	1885
Dr. J. N. McCormack	Bowling Green, Ky.	1880
Dr. Milton McCrimmon, Medical Health Officer, Township of Tratolga	Palermo, Ont.	1894
Dr. Champe Carter McCullock, C. E., First Lieutenant, Medical Department, U. S. A.	Fort Ringgold, Tex.	1894
J. D. McDonald, G. P. A., Grand Trunk R. R.	Buffalo. N. Y.	1896
Dr. J. D. McDonald	Hamilton, Ont.	1894
Alan McDougall, C. E.,	Toronto, Ont.	1886
Frank S. McGraw	Buffalo, N. Y.	1896

Dr. George Wilbur McGregor	Littleton, N. H.	1894
Dr. Peter J. McHugh, Health Physician	Fort Collins, Col.	1895
Thos. H. McKenzie, C. E., Member State Board of Health	Southington, Conn.	1893
Hon. D. H. McMillan	Ellicott Sq., Buffalo, N. Y.	1896
Dr. J. Henry McNeil	33 Sheboygan St., Fond du Lac, Wis.	1896
Dr. James Francis McShane,	2 So. Patterson Park Ave., Baltimore, Md.	1892
John J. McWilliams	Erie Co. Bank Building, Buffalo, N. Y.	1896
Daniel Webster Mead, C. E.,	Brown Building, Rockford, Ill.	1892
Dr. Julian Augustus Mead, Member Mass. State Board of Health	Irving St., Watertown, Mass.	1896
Dr. G. Mendicabal	Orizaba. Mex.	1893
Dr. C. F. Menninger, Member State Board of Health,	Topeka, Kan.	1895
Dr. Alfred Mercer	Syracuse, N. Y.	1886
Dr. Oscar F. Mercier, Surgeon Notre Dame Hospital,	144 St. Denis St., Montreal, P. Q.	1894
Dr. Albert Merrell	3814 Washington Ave., St. Louis, Mo.	1891
Isadore Michael	Mooney Building, Buffalo, N. Y.	1896
John G. Milburn	Ellicott Sq., Buffalo, N. Y.	1896
Charles W. Miller	Main and Eagle Sts., Buffalo, N. Y.	1896
Edwin S. S. Miller	Main and Tupper Sts., Buffalo, N. Y.	1896
George W. Miller	Delaware Ave., Buffalo, N. Y.	1896
Dr. Katharine Miller	513 Broadway, Lincoln, Ill.	1892
Dr. Henry Mitchell	Asbury Park, N. J.	1886
Mr. John Mitchell, President National Association Master Plumbers of the United States,	113 Hudson St., New York City.	1894
Dr. William Francis Mitchell	Lancaster, Mo.	1892
Dr. Jesus E. Monjaras, Cinco de Mayo	San Luis Potosi, Mex.	1891
C. Monjeau, C. E.	Middleton, Ohio.	1887
Dr. John Montgomery, State Superintendent of Public Health	Ardoch, N. D.	1895
Dr. L. H. Montgomery	70 State St., Chicago, Ill.	1879
Dr. Frederick Montizambert	Grosse Isle, Quebec, P. Q.	1885
F. J. Moore, General Agent N. Y., C. & St. L. R. R.	Buffalo, N. Y.	1896
Dr. Veramus A. Moore, Prof. Cornell University	Ithaca, N. Y.	1896
Hon. Adelbert Moot	Buffalo, N. Y.	1896
Dr. Jose Donaciano Morales, Hospicio San Nicholes 13,	Mexico. Mex.	1892
David Percy Morgan	1705 Locust St., Philadelphia, Pa.	1885
Dr. John Morris	118 E. Franklin St., Baltimore, Md.	1874
Dr. Moreau Morris	109 E. 73d St., New York City.	1896
William F. Morse, S. E.	58 Pine St., New York City.	1889
Dr. Eliza M. Mosher	Ann Arbor, Mich.	1889
Dr. Willis B. Moulton, Professor of Ophthalmology, Bowdoin College	180 State St., Portland, Me.	1894
Dr. John Wm. Mount	746 Notre Dame St., Montreal, P. Q.	1894
Dr. J. Muldoon	San Juan Bautista, Tabasco, Mex.	1896
Henry K. Mulford	412 So. 13th St., Philadelphia, Pa.	1896

Dr. Alexander J. Mullen, Jr.,	409 Washington St., Michigan City, Ind.	1892
Dr. William P. Munn, Health Commissioner,	709 Fourteenth St., Denver, Col.	1895
Howard Murphy, Civil and Sanitary Engineer, Member State Board of Health	326 Walnut St., Philadelphia, Pa.	1893
Dr. Robert D. Murray, U. S. M. H. S.	Mobile, Ala.	1872
John G. Nagel	Main St., Buffalo, N. Y.	1896
Dr. John T. Nagle	47 East 21st St., New York City.	1874
Dr. A. Nash	Joliet, Ill.	1887
Dr. Herbert M. Nash	Norfolk, Va.	1878
Edward T. Nelson, President of Ohio State Board of Health	Delaware, Ohio.	1894
Dr. Wolfred Nelson	Astor House, New York City.	1893
Dr. Wm. K. Newton	Paterson, N. J.	1883
Dr. S. A. Nichols	230 Brady St., Davenport, Ia.	1895
Dr. Alberto Noriega	Hermosillo, Sonora, Mex.	1891
Dr. Tomas Noriega	Hospital de Jesus, Mexico, Mex.	1892
William P. Northrup,	Washington and Exchange Sts., Buffalo, N. Y.	1896
Albert F. Noyes, C. E.	85 Water St., Boston, Mass.	1896
Dr. R. J. Nunn	114½ York St., Savannah, Ga.	1881
Dr. George H. F. Nuttall,	Allonaerstrasse 7th, Berlin, N. W., Germany.	1891
Dr. Charles Wilbur Nutting, Member State Board of Health	Etna, Cal.	1893
Dr. E. C. W. O'Brien	Delaware Ave., Buffalo, N. Y.	1896
Dr. J. H. O'Donnell, Chairman Provincial Board of Health	Winnipeg, Manitoba.	1893
Dr. William Oldright	Toronto, Ont.	1883
Dr. Samuel Rutherford Olliphant,	111 Prytania St., New Orleans, La.	1892
Dr. H. S. Orme	Los Angeles, Cal.	1885
Dr. John G. Orton	Binghamton, N. Y.	1890
Dr. Domingo Orvañanos	25 Chavarria St., Mexico, Mex.	1890
Dr. Edward Osgood Otis	308 Commonwealth Ave., Boston, Mass.	1894
Dr. Frank K. Paddock	Pittsfield, Mass.	1889
Mr. Louis Gustave Papineau, C. E., Resident Engineer Lachine Drainage System	369 St. Denis St., Montreal, P. Q.	1894
Dr. Paul Paquin, D. V. S.	3536 Olive St., St. Louis, Mo.	1891
Dr. Roswell Park	Delaware Ave., Buffalo, N. Y.	1896
Dr. John Parmenter	Franklin St., Buffalo, N. Y.	1896
H. Parry, C. T. A., N. Y. C. & W. S. R. R.	Buffalo, N. Y.	1896
Dr. James Patterson, Chairman Provincial Board of Health	277 Donald St., Winnipeg, Manitoba.	1894
Dr. George Farrar Patton, Secretary State Board of Health	1134 Camp St., New Orleans, La.	1896
W. H. Peabody	Main St., Buffalo, N. Y.	1896
Dr. George Peck, U. S. Navy	926 No. Broad St., Elizabeth, N. J.	1890
Dr. Elzéar Pelletier	Montreal, P. Q.	1892
Henry E. Pellew, Esq.	Katonah, N. Y.	1876

Mr. Maurice Perrault	97 St. Jacques St., Montreal, P. Q.	1894
Dr. Thomas B. Perry, P. A. Surgeon, U. S. M. H. S.,	414 Delaware Ave., Buffalo, N. Y.	1896
Dr. John A. Pettit, Health Officer	519 Swan St., Buffalo, N. Y.	1896
Dr. William C. Phelps	146 Allen St., Buffalo, N. Y.	1896
Dr. Philippe Picard	Fraserville, P. Q.	1894
R. V. Pierce	663 Main St., Buffalo, N. Y.	1896
Dr. Robert L. Pitfield	5450 Germantown Ave., Philadelphia, Pa.	1896
Dr. J. D. Plunket	Nashville, Tenn.	1878
Dr. J. D. Poindexter, U. S. A.	Fort Riley, Kan.	1896
Dr. Joseph Y. Porter, U. S. A.	Key West, Fla.	1878
Mr. Henry Powles	Broad St., Newark, N. J.	1894
Mr. Pascal P. Pratt	736 Main St., Buffalo, N. Y.	1896
Dr. Susan Remsen Pray	191 So. Ninth St., Brooklyn, N. Y.	1896
Dr. Maurice Pritchard, Health Officer, President Board of Health	Sierra Valley, Cal.	1893
Dr. C. O. Probst	Columbus, Ohio.	1886
Dr. Helen C. Putnam	24 Greene St., Providence, R. I.	1894
Dr. Taylor E. Raines, President State Board of Health,	Concordia, Kan.	1895
Dr. José Ramirez	Plazuela Buena Vista 1626, Mexico, Mex.	1892
Dr. Douglas C. Ramsay	Mount Vernon, Ind.	1894
Frank Bert Rasbach	172 Allen St., Buffalo, N. Y.	1896
Dr. William C. Ravenel	Charleston, S. C.	1890
Dr. Allen A. Rawson	Corning, Ia.	1892
Dr. Joseph H. Raymond	173 Joralemon St., Brooklyn, N. Y.	1882
Dr. J. R. Raymond, Inspecteur de Lait,	751 Cadieux St., Montreal, P. Q.	1894
Dr. Thomas D. Reed, Lecturer in Hygiene at McGill Normal School	91 University St., Montreal, P. Q.	1894
Dr. J. T. Reeve	Appleton, Wis.	1876
Dr. Alex P. Reid, Secretary Provincial Board of Health for Nova Scotia	Halifax, N. S.	1894
Dr. Edward A. Reiley	312 Baldwin St., Elmira, N. Y.	1890
F. W. Reilly	Room 2, City Hall, Chicago, Ill.	1896
Ottomar Reinecke	Buffalo, N. Y.	1896
Dr. Augustin Reyes	Mexico, Mex.	1892
Dr. A. R. Reynolds, Commissioner of Health	Chicago, Ill.	1893
Dr. Arthur Ricard, Physician at Notre Dame Hospital	146 St. Denis St., Montreal, P. Q.	1894
Edgar Richards	341 W. 88th St., New York City.	1889
Mrs. E. H. Richards, Institute Technology	Boston, Mass.	1888
Dr. Abel Parker Richardson	Walpole, N H.	1894
Maj. Henry B. Richardson, C. E.	New Orleans, La.	1880
Dr. W. L. Richardson	225 Commonwealth Ave., Boston, Mass.	1875
Henry A. Richmond	Delaware and Tupper Sts., Buffalo, N. Y.	1896
J. M. Richmond	23 Franklin St., Buffalo, N. Y.	1896
Dr. George Riddle, Member Provincial Board of Health	Crystal City, Manitoba.	1895

Dr. William C. Rives	22 West 33d St., New York City.	1885
Dr. Charles F. Roberts, Health Department	New York City.	1892
Hon. James A. Roberts	Mooney Building, Buffalo, N. Y.	1896
Dr. John B. Roberts	1627 Walnut St., Philadelphia, Pa.	1886
Dr. Adolphe Robillard, City Health Officer,	City Hall, Ottawa, Ont.	1896
Dr. A. C. Robinson, Member of Board of Health	3402 Pine St., St. Louis, Mo.	1894
Dr. DeLorme W. Robinson, President of State Board of Health of South Dakota	Pierre St., Pierre, So. Dak.	1894
Prof. Franklin C. Robinson	Brunswick, Me.	1889
Dr. John Franklin Robinson	Manchester, N. H.	1894
Dr. Thomas George Roddick, Professor of Surgery, McGill University	80 Union Ave., Montreal, P. Q.	1894
Dr. Francis J. Rogers	Stamford, Conn.	1889
Hon. Sherman S. Rogers	Erie St., Buffalo, N. Y.	1896
Dr. George H. Rohé	Skyesville, Md.	1880
Dr. Eliza H. Root, Prof. Hygiene and Medical Jurisprudence, Woman's Medical School, Northwestern University	Chicago, Ill.	1893
Dr. Jean Philippe Rottot, Dean Medical Faculty, Laval University	Montreal, P. Q.	1894
Dr. L. J. Hercule Roy, Compilateur des Statistiques au Council Provincial d' Hygiene	76 St. Gabriel St., Montreal, P. Q.	1894
Dr. Carl Ruedi	1711 Grant Ave., Denver, Col.	1895
J. Rump, C. E.	Copenhagen, Denmark.	1893
Dexter P. Rumsey	Delaware Ave. and Tracy St., Buffalo, N. Y.	1896
Dr. Julia Wallace-Russell	44 Pleasant St., Concord, N. H.	1892
Dr. R. F. Ruttan, Lecturer on Hygiene,	McGill University, Montreal, P. Q.	1893
Dr. Wallace Edgar Sabin, Health Officer	1756 Fifteenth St., Highlands, Col.	1895
Dr. P. D. St. John, Member State Board of Health	Wichita, Kan.	1895
Dr. E. M. Sala	1807 5th Ave., Rock Island, Ill.	1896
D. E. Salmon, D. V. M.	Washington, D. C.	1883
Dr. José A. Samaniego	Ciudad Juarez, Chihuahua, Mex.	1892
Dr. Francisco Sanchez	Puebla, Puebla, Mex.	1892
Dr. Carlos Santa-Maria	Durango, Mex.	1896
August Schneider, Health Department	Buffalo, N. Y.	1896
Dr. W. L. Schenck	Topeka, Kan.	1891
Dr. Henry Ernest Schmid, President Board of Health,	White Plains, N.Y.	1896
Hon. Arthur Schoellkopf	Niagara Falls, N. Y.	1896
Dr. Warren Schoonover, House Physician, and Secretary Northeastern Dispensary	115 East 59th St., New York City.	1895
Dr. Henry S. Scull, Secretary Board of Health	Atlantic City, N. J.	1896
Dr. John H. Sears	Waco, Tex.	1887
Dr. Henry Sewall, Secretary State Board of Health,	23 Eighteenth Ave., Denver, Col.	1894
Dr. Joseph Sharp	1027 Cherry St., Kansas City, Mo.	1891

Dr. W. L. Shenk	New Castle, Col.	1895
Dr. Charles H. Shepard	Columbia Heights, Brooklyn, N. Y.	1892
Dr. Francis J. Shepherd, Professor of Anatomy	152 Mansfield St., Montreal, P. Q.	1894
Dr. George R. Shepherd	667 Asylum St., Hartford, Conn.	1886
Dr. Charles Shiard	Toronto, Ont.	1896
Dr. G. M. Shillito	Roup St., Pittsburgh, Pa.	1892
Dr. John C. Shrader	Iowa City, Ia.	1890
Dr. Edward B. Shuttleworth, Professor of Bacteriology, Trinity Medical College	220 Shartowne St., Toronto, Ont.	1895
Dr. M. O. Silva	Morelia, Mex.	1892
Dr. E. T. Arthur Simard, Professor of Hygiene, Laval University	10 Du Parloir St., Montreal, P. Q.	1894
Dr. T. Grange Simons	Charleston, S. C.	1881
Dr. James Simpson	San Francisco, Cal.	1886
Dr. Freeman Evans Small	776 Congress St., Portland, Me.	1894
Dr. Charles Smart, U. S. A.	Washington, D. C.	1882
Dr. Baxter T. Smelzer, Secretary State Board of Health	229 Hamilton St., Albany, N. Y.	1895
Dr. Charles D. Smith	Portland, Me.	1885
Prof. E. J. Smith, Professor of Chemistry, University of Wisconsin	Beloit, Wis.	1895
Dr. Frederick W. Smith	700 S. West St., Syracuse, N. Y.	1896
Dr. Hugh M. Smith	78 Orange St., Brooklyn, N. Y.	1889
Dr. J. Sol Smith	Denver, Col.	1895
Dr. Joel W. Smith	Charles City, Ia.	1888
Dr. Stephen Smith	640 Madison Ave., New York City.	1872
T. Guilford Smith	Ellicott Sq., Buffalo, N. Y.	1896
Dr. William M. Smith	91 First Pl., Brooklyn, N. Y.	1880
Dr. William T. Smith, Member Board of Health	Hanover, N. H.	1896
Dr. S. Edwin Solly	2 Cascade Ave., Colorado Springs, Col.	1895
George A. Soper, C. E.	Goldthwaite House, Bellport, N. Y.	1896
Dr. James D. Spencer	59 Washington St., Watertown, N. Y.	1896
Dr. John R. Spier, Physician to Civic Hospital	2439 Notre Dame St., Montreal, P. Q.	1894
John Spirked, D. D. S.	287 W. 12th St., Chicago, Ill.	1892
Dr. Eli L. Standlee	2201 University Pl., St. Louis, Mo.	1895
Dr. Byron Stanton	Cincinnati, Ohio.	1889
Dr. Franklin Staples	Winona, Minn.	1885
Dr. Ralph E. Starkweather	Dearborn and Washington Sts., Chicago, Ill.	1879
Dr. Arnold Stedman, President State Board of Health,	722 14th St., Denver, Col.	1895
Surgeon-General George M. Sternberg, U. S. A.,	Washington, D. C.	1874
Dr. James A. Steuart	1611 John St., Baltimore, Md.	1874
Dr. James Stewart, Professor of Medicine, McGill University	285 Mountain St., Montreal, P. Q.	1894

Dr. Charles G. Stockton	Buffalo, N. Y.	1896
Dr. A. Walter Suiter	Herkimer, N. Y.	1894
Dr. John C. Sundberg	1819 Clay St., San Francisco, Cal.	1892
Dr. Quincy Orlin Sutherland, Member State Board of Health	73 Milwaukee St., Janesville, Wis.	1895
Dr. H. C. Sutton, Health Officer	220 N. James St., Rome, N. Y.	1896
Dr. Gardner Taber Swarts, Secretary State Board of Health, and Registrar of Vital Statistics	Providence, R. I.	1894
Dr. R. M. Swearingen	Austin, Tex.	1880
Miss Ada Sweet, Vice-President Municipal Order League	175 Dearborn St., Chicago, Ill.	1893
Dr. Samuel D. Swope	Deming, N. M.	1895
Miss Marion Talbot, Assistant Professor Sanitary Science, University of Chicago	University of Chicago, Chicago, Ill.	1893
Dr. Alexander N. Talley	Columbia, S. C.	1890
Mr. Thomas W. Taylor, Mayor of City of Winnipeg	458 Bannontyne St., Winnipeg, Manitoba.	1894
William C. Teichmann, Ph. D.	1141 Market St., St. Louis, Mo.	1896
Dr. H. S. Terrill	Fort Riley, Kan.	1895
Dr. Francis J. E. Tetreault	110 Main St., Orange, N. J.	1894
Hon. Joseph Rosaire Thibaudeau	857 Palace St., Montreal, P. Q.	1894
M. Louise Thomas	680 Lexington Ave., New York City.	1888
Wolferstan Thomas, President Montreal General Hospital	Sherbrooke St., Montreal, P. Q.	1894
Dr. J. G. Thompson	Angola, N. Y.	1896
Dr. Pinckney Thompson	Henderson, Ky.	1879
S. J. Thompson	Third Ave., Carbeny, Manitoba.	1896
Dr. G. B. Thornton	Memphis, Tenn.	1879
Dr. A. D. R. Thrane	Eau Claire, Wis.	1889
Mr. E. T. Tifft	Springfield, Mass.	1892
T. S. Timpson, C. E. A., L. S. & M. S. R. R.	Buffalo, N. Y.	1896
William H. Tolman, Ph. D., General Agent N. Y. Asso. for Improving the Condition of the Poor	105 East Twenty-Second St., New York, N. Y.	1896
Dr. S. R. Towne, Assistant Health Commissioner	Omaha, Neb.	1895
Dr. Robert Tracy, Medical Health Officer	Hotel St., Belleville, Ont.	1894
Dr. Roger S. Tracy	74 West 46th St., New York City.	1889
Dr. Lorenzo Traver	5 Stewart St., Providence, R. I.	1892
C. S. Treat	Buffalo, N. Y.	1896
Dr. William S. Tremaine	Elmwood Ave., Buffalo, N. Y.	1896
Dr. H. G. Tucker	1270 N. Vine St., Nashville, Tenn.	1896
W. U. Tunison, C. T. A., B., R. & P. R. R.	Buffalo, N. Y.	1896
Dr. Thomas J. Turner, U. S. N.	Coldwater, Mich.	1877
W. H. Underwood, G. E. P. A., M. C. R. R.	Buffalo, N. Y.	1896
George Urban, Jr.	Oak and Genesee Sts., Buffalo, N. Y.	1896
Dr. Ferd C. Valentine	242 West 43d St., New York, N. Y.	1896
Dr. J. H. Van Deman	Chattanooga, Tenn.	1873

Joseph Emile Vanier, I. C.	107 St. James St., Montreal, P. Q.	1894
Dr. E. V. Van Norman	San Diego, Cal.	1882
Dr. P. W. Van Peyma	William and Koettner Sts., Buffalo, N. Y.	1896
Dr. Victor C. Vaughan	Ann Arbor, Mich.	1883
Dr. Harry E. Vaux, Member Provincial Board of Health	Brockville, Ont.	1894
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ANNUAL VOL No. XXII. OCTOBER, 1897. QUARTERLY SERIES, VOL. III. PART 4.

Journal of the American Public Health Association

Published Quarterly

SUBSCRIPTION, $5.00 PER YEAR.

PUBLISHED BY THE
American Public Health Association,
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